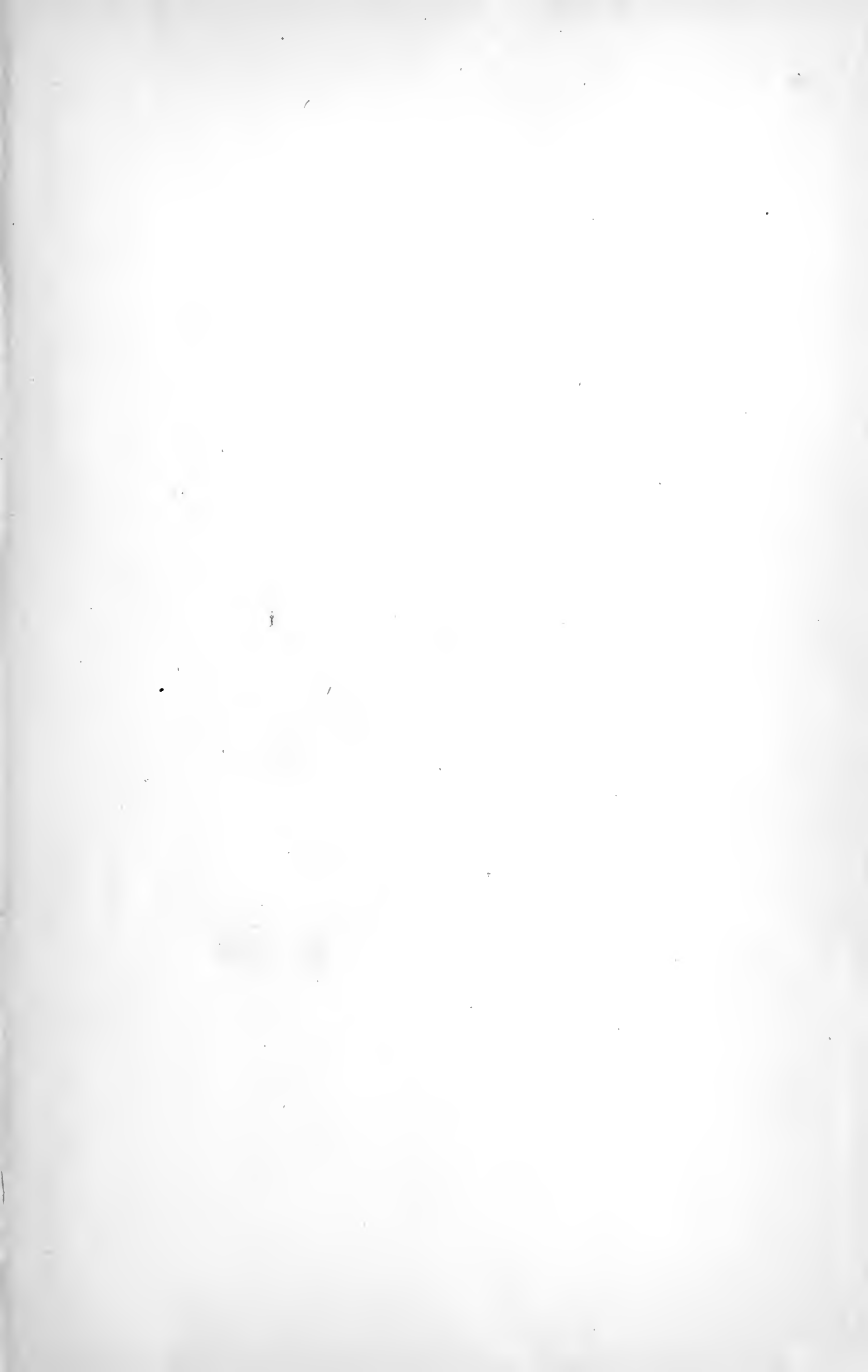




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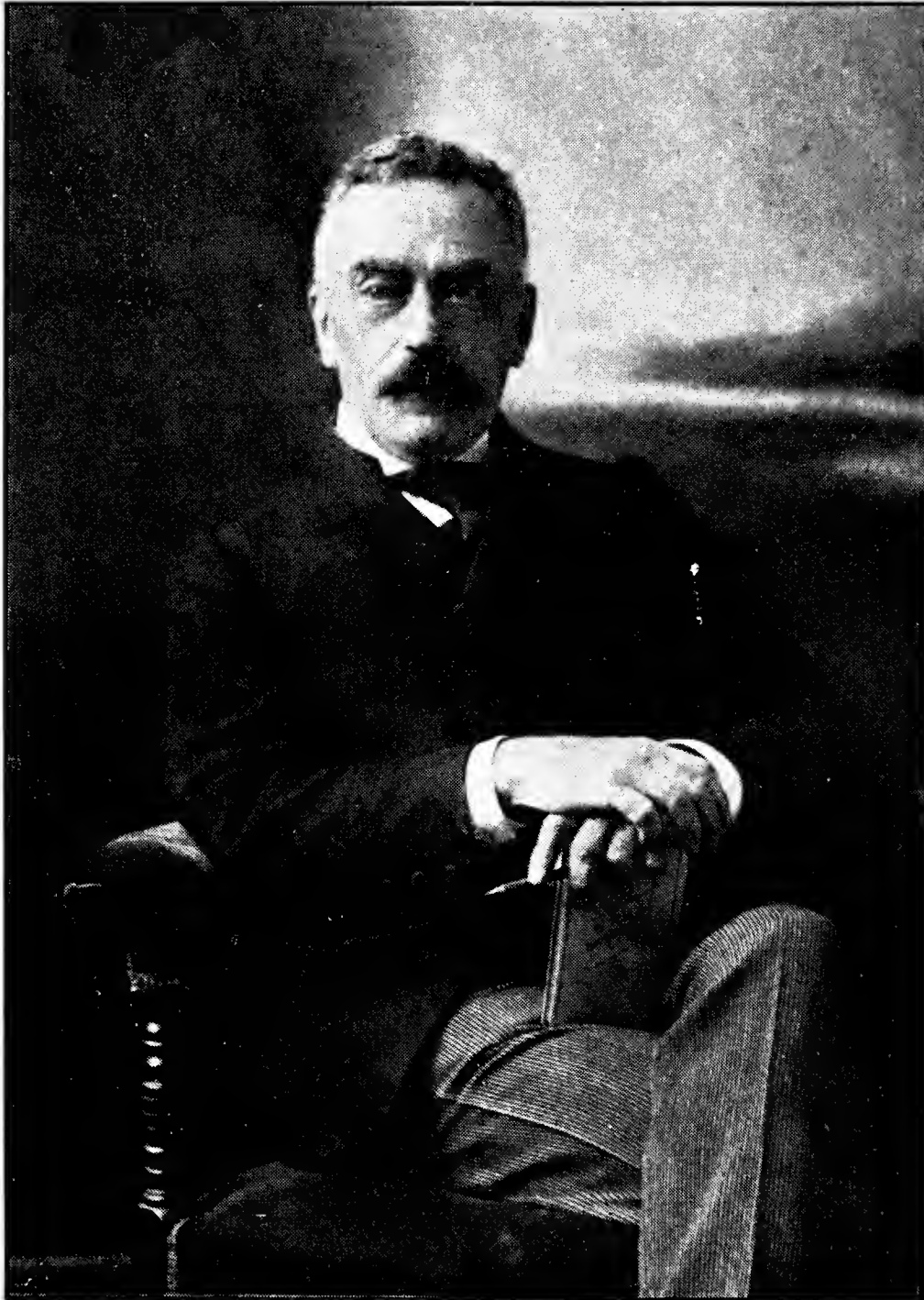
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Yours truly
M. G. Faylor

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ZWEI NEUE PILZE AUS OHIO.

PH. DR. FRANCIS BUBAK, PRAGUE, BOHEME.

Bei der Bestimmung eines in Böhmen auf *Equisetum elongatum* gesammelten Pilzes zog ich auch das von Kellerman in "Ohio Fungi" No. 18 vertheilte *Gloeosporium equiseti* E. & E. zum Vergleich heran. Bei der Gelegenheit fand ich, dass mein Exemplar der genannten Nummer eine *Stamnaria*-Art ist, die sich von der europäischen *Stamnaria equiseti* (Hoffm.) Sacc., wie sie z. B. bei Rehm ⁽¹⁾ beschrieben, oder von Bäumler ⁽²⁾ aus Ungarn und mir selbst ⁽³⁾ aus Böhmen vertheilt worden ist, in einigen wichtigen Characteren unterscheidet, so dass sie für eine neue Species gehalten werden muss. Ich erlaube mir die neue Art nach dem um die mykologische Flora Ohio's so hochverdienten Forscher zu benennen:

STAMNARIA.....⁽⁴⁾ Apothecien gewöhnlich in kleinen Gruppen oder in kurzen Reihen gestellt, meist eingesenkt, dann hervorbrechend, anfangs geschlossen, kugelig, später becherför-

⁽¹⁾ Rehm; *Ascomyceten*, pag. 466 in *Rab. Kryptog. Flora*.

⁽²⁾ *Kryptogamæ exsiccatae* Nr. 628. *Museum palat. Vindobonense*.

⁽³⁾ Vestergren; *Micromycetes rariores* Nr. 468.

⁽⁴⁾ I take the liberty of withholding the name proposed, being convinced before the article is printed, that the species is the same as that very recently described by Massee & Morgan, namely *Stamnaria ameri-*

mig mit kurzem, dickem Stiele, 0.2-0.7 mm. im Durchmesser, orangegelb, glänzend, feucht wachsartig, weich, trocken hornartig fest. Asken lang-keulenfoermig, nach unten allmaehlig aber stark verschmaelert, oben stumpf-spitzlich, 120-250 μ lang, 15-18 μ breit, 8-sporig. Sporen länglich, ungleichseitig oder leicht gekrümmt, 22-33 μ lang, 4.5-6.5 μ breit, im oberen Theile des Schlauches 2-reihig, unten einreihig. Paraphysen so lang oder etwas länger als die Asken, dünn (1-1.5 μ), oben keulenförmig auf 2.5-4 μ erweitert.

Auf *Equisetum robustum* R. Br., bei Logan, Hocking county, Ohio, am 8 October 1894, legit Kellerman (Ohio Fungi, Nr. 18).

Von *Stamnaria equiseti* (Hoffm.) Sacc. durch die Form und Grösse der Asken, wie auch durch die Grösse der Sporen genügend verschieden.

In Saccardo Syllog. XVI findet sich von *Stamnaria equiseti* eine Varietät *herjedalensis* Rehm beschrieben. Diese Varietät wurde von Lagerheim in Schweden bei Tjellnaess in Herjedalia auf *Equisetum variegatum* gesammelt. Sie unterscheidet sich nach der Diagnose von der Stammart durch cylindrisch-keulenförmige, nur 50 μ lange, 5-6 μ breite Asken und ebenfalls durch kleinere, 10 μ lange, 3 μ breite Sporen.

Ich halte diese Varietät, ebenfalls wie die amerikanische Form, für eine selbständige Art, *Stamnaria herjedalensis* (Rehm).

Im J. 1901 sammelte ich in Montenegro (Balkanhalbinsel) auf *Malva silvestris* eine *Cercospora*-Art. Bei vergleichendem Untersuchen aller *Althaea*- und *Malva*-bewohnenden *Cercospora*-Arten, erwiesen sich der montenegrinische und der von Kellerman in Ohio, bei Columbus, auf *Althaea rosea* Cav. (Ohio Fungi, Nr. 64) gesammelte Pilz, als zwei neue, von *Cercospora Althae-*

cana, cfr. Jour. Mycol. 8:183, Dec. 1902. Dr. Bubak's description was drawn up before the publication (Dec. 20) of Massee & Morgan's paper could have reached him. At the time of the present article going through the press, it was of course impossible to consult with Dr. Bubak relative to this matter, and I have therefore ventured to allow his valuable notes and diagnosis to appear, believing that he will pardon me for excluding temporarily the name which he kindly bestowed with reference to myself. I may also add that Professor Morgan's judgment coincides with mine in reference to the plant I sent out inadvertently under the name of *Gloeosporium equiseti* E. & E. (No. 18. O. F.)—considering it the same as the *Stamnaria americana* Mass. & Morg. He suggests also that greater range might be given to the measurement of asci and spores than that which Mr. Massee drew up — "say asci 150-175x12-16, spores 25-30x6-8."

W. A. KELLERMAN, Editor.

Feb. 1903]

Lepidoderma Geaster (Link)

ina Sacc., Cerc. malvacearum Sacc. und Cerc. nebulosa Sacc. gut unterscheidbare Species.

Ich erlaube mir auch die letztgenannte Art zu Ehren des Herrn Prof. Dr. W. A. Kellerman zu nennen. Die Diagnose des monteigrinischen Pilzes werde ich an anderem Orte veröffentlichen.

CERCOSPORA KELLERMANI Bubák n. sp.—Flecken auf beiden Blattseiten, unregelmässig, eckig, von den Blattnerven begrenzt, olivenbraun, undeutlich graulich umrandet, oft zusammenfließend, bis 1 cm. im Durchmesser. Fruchtträger auf beiden Blattseiten, büschelweise, schlank, wenig verbogen, bis 150μ lang, $4-5\mu$ breit, oft fast schon vom unteren $\frac{1}{4} - \frac{1}{3}$ entfernt gezähnt (bis 6 Zähne), mit 3-5 Querwänden, olivenbraun, manchmal an der Spitze heller. Conidien nadelförmig, $50-150\mu$ lang, $4-5\mu$ breit, mit 5-15 Querwänden, gerade oder wenig gekrümmt, hyalin, gegen den Scheitel allmählich, schweiförmig verschmälert.

Auf *Althaea rosea* Cav., bei Columbus, Ohio, am 9 Juni 1901, legit Kellerman (Ohio Fungi, Nr. 64).

Cercospora kellermani ist am nächsten nur mit *Cerc. malvacearum* Sacc. verwandt, welche bei Rouen in Frankreich auf *Malva moschata* gesammelt wurde. Sie unterscheidet sich aber von derselben, als auch von *Cerc. althaeina* Sacc. durch vielzellige Conidien, von der letztgenannten Art auch durch längere Conidienträger.

Prague, am 16. December 1902.

LEPIDODERMA GEASTER (LINK.)

A. P. MORGAN.

Within my range, I not long ago met with a very interesting species of Myxomyces. Of the old descriptions, the one that fits it best is that of *Didymium geaster* Link, Obs. II, 1816. It is true that Rostafinski places this name as a synonym under *Chondrioderma radiatum* (L.), but this is only a surmise of his, and the judgment of Fries is better. Furthermore, Fries observes that this species recedes from *Diderma trevelyani* (Grev.) in that it grows on wood and not on mosses. Hence, it seems plausible

there are at least two species making the trouble with the specimens and possibly more than two.

The synonyms under *Chondrioderma trevelyani* given in Lister's Mycetozoa are:

1. *Leangium trevelyani* Greville, Crypt. Fl. 1825.
2. *Diderma trevelyani* Fries, Syst. Myc. 1829.
3. *Chondrioderma oerstedtii* Rostafinski, Mon. 1875.
4. *Diderma geasteroides* and *D. laciniatum*, Phillips, Grevillea, 1877.
5. *Chondrioderma geasteroides* Massee, Mon. Myx. 1892.

Rostafinski makes two species of 1, 2 and 3, *Ch. trevelyani* with a columella and *Ch. oerstedtii* without a columella. Massee confirms the species of Rostafinski and adds a third, *Ch. geasteroides*, to include Phillips's two Californian species; this has a columella.

I may here remark that the British Jedburgh specimen is not the type of *Ch. oerstedtii* as stated by Lister; this author's use of *type* is very loose. Lister combines all these 1, 2, 3, 4, 5 into a single species; he says the sporangium wall is composed of "three inseparable layers," which is an absurdity upon the face of it; and he finds no columella in any of the specimens.

Now as to my specimen: It consists of more than one hundred sporangia, of which about half are split open, growing on a piece of wood. The dry mature sporangium is polyhedral in shape, the lines of dehiscence along the edges being paler in color; it splits from the apex downward into several open or spreading segments, sometimes the polygonal apex is torn off and adheres to one of the segments.

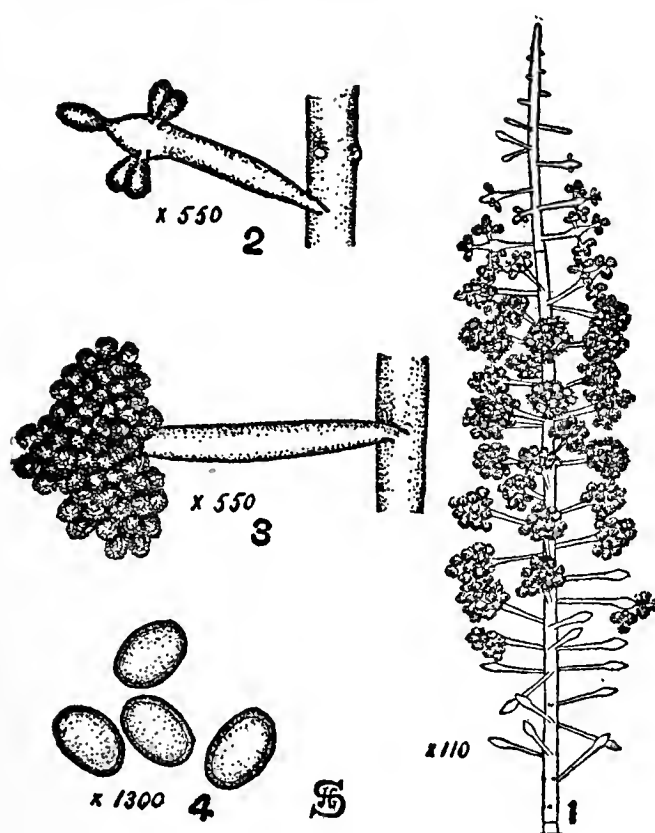
The wall is thick composed of a dense layer of glossy scales connate with the membrane, the surface of which is verrucose within and without, the outer surface pale umber, the inner glossy-white. The stipe is very short, slender, concolorous or nearly obsolete; the columella elliptic-oblong, verrucose, usually ejected along with the spore-mass at the time of dehiscence of the sporangium. I can, however, count many columellas remaining at the bottom of the open sporangia, though they are all clean of spores. The capillitium consists of slender, branched, dark-colored threads, forming a scanty network. The spores are globose, smooth ($\times 500$), purplish-brown, 13-16 mic. in diameter.

The line in the wall of the sporangium seems to me of the same nature as in the genus *Lepidoderma*.

A NEW SPECIES OF CEPHALOSPORIUM.

W. A. KELLERMAN.

A quantity of conspicuous conidiophores was noticed on a single dead stem in the greenhouse of the Botanical Department, Ohio State University. This was subjected to examination but its identification with any described species was not satisfactory



and accordingly the material was placed in the hands of Mr. J. B. Ellis for inspection, who pronounced it an undescribed species of *Cephalosporium*. A drawing to illustrate the appearance and structure was made with the aid of the camera by J. G. Sanders, the figures 1, 2-3, and 4 being magnified 110, 550, and 1300 diameters respectively, but reduced to one-half these dimensions by the engraver. The description of the species is as follows:

CEPHALOSPORIUM DENDROIDES E. & K. — On dead herbaceous stems in a green-

house (Ohio; Kellerman, 3982).

Sterile hyphæ inconspicuous; fertile hyphæ erect, continuous, hyaline, about 1 mm. high, and 6-7 μ thick, sending out from the upper half of their length numerous short branches at right angles with the central erect hyphæ, narrowed below, their tips swollen and bearing the elliptical or oblong-elliptical, hyaline, 4-6 \times 2-3 μ conidia in a loosely compacted head. The fertile hyphæ stand scattered singly and with their numerous branches bearing the snow-white conidia resemble a miniature forest after a snow storm.

Corresponds to *Stachylidium* in the Dematiææ.

UREDINEOUS INFECTION EXPERIMENTS IN 1902.⁽¹⁾

W. A. KELLERMAN.

(²) A series of sixty-seven experiments were carried on in 1902, beginning April 7 and ending June 24. All were performed with host-plants previously transferred to the greenhouse, and were at the time of attempted inoculation, with few exceptions, in a satisfactory growing condition. Plants not removed from their natural habitat were used later in the season in a very few cases, but the method of procedure in the experiments was the same as that followed in the greenhouse.

Seventeen forms of Uredines were used in the inoculations. Of these seven yielded satisfactory results. In a case of two so meagre evidence was obtained that it is best to regard them, if artificial inoculations at all, at least as undecisive.

Infections were made in the usual way, namely by moistening the supposed host-plant by means of an atomizer; then depositing on the tender growing portions a quantity of the spores supposed to be viable. The plants were immediately covered with a bell-jar or suitable substitute therefor — this removed daily or oftener, but only long enough to repeat the use of the atomizer. After ample time for germination of the spores the covers were discarded.

Precautions were taken to guard against possible accidental infection. Spores of only one Rust species were used on any one day, and so far as practicable scalpels, forceps, camel's-hair brushes, and watch crystals were used but once; or if again needed were called into requisition only after thorough cleansing and disinfection.

At any one part of the work table or bench in the greenhouse, inoculations were never made with more than one species of Rust. It was feasible to carry on the work in different places, as in different sections of the greenhouse, different laboratory rooms, etc. This was believed to be a safeguard — possibly over cautious — against accidental infection.

In the earlier experiments a cover for the host-plant, a cylinder 18 to 20 inches high made of coarse wire netting and surrounded with muslin, was very satisfactory. Later, when the greenhouse was more freely ventilated, the evaporation was too rapid, and bell-jars or suitable frames made of narrow strips of galvanized iron with glass sides and tops were substituted. The plants were usually kept covered 3 or 4 days — or even 5 or 6

(¹) Contributions from the Botanical Laboratory of the Ohio State University. XI.

(²) The substance of this paper was presented before the Botanical Society of America, Jan. 1, 1903, under the title Uredinous Infection: Suggestions and Experiments.

days, a longer period than most experimenters consider necessary.

It is thought by some who have carried on uredinous inoculations extensively, that infection work in advance of the normal season of the parasitic species is fruitless effort. This is perhaps true in many cases, but my experiments with *Puccinia atkinsoniana* shows that it may be profitable. With this species inoculations were made on *Sambucus canadensis* April 7, the host-plant having been transplanted to the greenhouse January 10. The old leaves of *Carex lurida* harboring the teleutospores, exposed in their natural habitat all winter, were placed in the warm greenhouse a month and a half in advance of their use. Evidences of successful inoculation were noticeable April 15. By this early success it was possible to verify the result by repetitions of the experiment, as was done April 19 with corroborative result, also again April 25 with similar outcome, and for the fourth time — on host-plants growing out of doors — May 15, with a quadruply conclusive result. Using the teleutospores of *Puccinia bolleyana* on *Sambucus canadensis* in the greenhouse April 24, spermogonia and æcidia were obtained. This experiment was repeated May 24 on plants growing out of doors and in due time the former result was corroborated.

By this pre-season inoculation when possible, the correctness of first results can be verified the same year. This is advantageous — especially in the remarkable case cited above where apparently similar æcidia have been obtained on *Sambucus* by sowing spores of — as heretofore understood — two morphologically different species.

The experiments enumerated below include failures as well as successes. The latter can be repeated for verification and the former may to some extent, perhaps, be a guide to other experimenters. When work on the American species has been more extensively performed, the literature can doubtless be saved the burden of so numerous failure-records. It may yet be profitable, perhaps, to undertake more or less work with barely perceptible or vaguely suspected clues, though the advantage of experiment with previously observed evidence or very strong hints of relationship is fully appreciated.

PUCCINIA ATKINSONIANA DIET. ⁽³⁾ FROM CAREX LURIDA.

- Exp. 1. April 7. Teleutospores sown on *Sambucus canadensis*.
— Spermogonia appeared April 15; æcidia April 24.
Exp. 2. April 19. Teleutospores sown on *Sambucus canadensis*.
— Spermogonia April 25; æcidia April 30.
Exp. 3. April 19. Teleutospores sown on *Sambucus canadensis*.
— Spermogonia April 25; æcidia April 30.

⁽³⁾ *Puccinia sambuci* (Schw.) Arthur n. n., Bot. Gaz. 35:15. Jan. 1903.

- Exp. 5. April 25. Teleutospores sown on *Sambucus canadensis*.
— Aecidia May 7.
- Exp. 6. April 25. Teleutospores sown on *Onagra biennis*.
— No infection.
- Exp. 7. April 27. Teleutospores sown on *Impatiens biflora*.
— No infection.
- Exp. 8. April 27. Teleutospores sown on *Urtica gracilis*.
— No infection.
- Exp. 32. May 7. Teleutospores sown on *Sambucus canadensis*.
— Spermogonia May 14; aecidia May 24.
- Exp. 33. May 7. Teleutospores sown on *Onagra biennis*.
— No infection.
- Exp. 44. May 14. Teleutospores sown on *Sambucus canadensis*.
— Spermogonia May 23; aecidia May 26.
- Exp. 45. May 14. Teleutospores sown on *Sambucus canadensis*.
— Spermogonia May 23; aecidia May 26.

It will be seen from the above that, using the teleutospores of *Puccinia atkinsoniana*, successful inoculation followed only when the Elder (*Sambucus canadensis*) was used as the host — *Onagra biennis*, *Impatiens biflora*, and *Urtica gracilis* not being susceptible. The Rust was identified by Dr. J. C. Arthur, who informed me that it had been compared with the type. In spite of the fact that I had early in the winter entertained the opinion, based on field observation, that the alternate form of this Rust was the *Aecidium* on Elder, the result of the first inoculation (Exp. 1) was a matter of much astonishment, because in the meantime it had been learned that aecidia on Elder had been obtained, by Dr. Arthur, by sowings of teleutospores of *Puccinia bolleyana* Sacc. from *Carex trichocarpa* (cfr. Jour. Mycol. 8:55, June 1902). Believing that a mistake might perhaps in some way have occurred, additional experiments were instituted in the greenhouse, namely, Expts. 2 and 3 above. The result was a duplication of the first. The same can be said of Exp. 5, still later carried on. I could scarcely maintain a skeptical attitude in the case longer, yet it was determined to perform the work once again. This time it was decided to select host-plants growing out of doors in a neighboring grove. The decisive results again obtained, see Expts. 44 and 45, could allow no possible doubt — especially since the numerous unprotected plants, adjacent as well as at a distance, were entirely free from aecidia. Finally it may be said that the aecidia obtained by the inoculations were apparently the form ordinarily designated as *Aecidium sambuci* Schw.

PUCCINIA BOLLEYANA SACC.(⁴) FROM CAREX TRICHOCARPA.

- Exp. 4. April 24. Teleutospores sown on *Sambucus canadensis*.
— Few spermogonia May 1; few aecidia May 14.
- Exp. 46. May 14. Teleutospores sown on *Sambucus canadensis*.
— Few spermogonia May 23; few aecidia May 26.

(⁴) *Puccinia sambuci* (Schw.) Arthur n.n. Bot. Gaz. 35:15. Jan. 1903.

- Exp. 47. May 14. Teleutospores sown on *Sambucus canadensis*.
— Few spermogonia May 23; few aecidia May 26.

It will be observed that teleutospores of *Puccinia bolleyana* Sacc. from *Carex trichocarpa*, kindly furnished me for culture by Dr. Arthur from the type locality in Indiana, as well as of *Puccinia atkinsoniana* Diet. from *Carex lurida* infect the Elder (*Sambucus canadensis*); no differences were observed in the resulting aecidia. But this is a subject for further study.⁽⁵⁾ As stated above, Dr. Arthur has previously reported successful infection using the same species of parasite and host. Cfr. Jour. Mycol. 8:55, June 1902.

PUCCINIA PECKII (DETONI) KELLERM. (P. CARICIS AUCT.)
FROM CAREX TRICHOCARPA.

- Exp. 14. April 29. Teleutospores sown on *Sambucus canadensis*.
— No infection.
Exp. 15. April 29. Teleutospores sown on *Urtica gracilis*.
— No infection.
Exp. 16. April 29. Teleutospores sown on *Impatiens fulva*.
— No infection.
Exp. 26. May 4. Teleutospores sown on *Onagra biennis*.
— Spermogonia and immature aecidia. (Host failed in health and died.)
Exp. 27. May 4. Teleutospores sown on *Impatiens biflora*.
— No infection.

Sowings on one host only, namely, the Common Evening Primrose (*Onagra biennis*) were successful; the aecidia known as *Ae. peckii* DeToni (*Ac. oenotherae* Peck) therefore is the alternate form of the rust on *Carex trichocarpa* previously designated as *Puccinia caricis*, and the name to be used is *Puccinia peckii* (DeToni) Kellerm. This was published May 31, 1902 (Jour. Mycol. 8:20, May 1902.)

PUCCINIA CARICIS (SCHUM.) REB. FROM CAREX RIPARIA.

- Exp. 18. April 30. Teleutospores sown on *impatiens biflora*.
— No infection.
Exp. 19. April 30. Teleutospores sown on *Pentstemon pubescens*.
— No infection.
Exp. 20. April 30. Teleutospores sown on *Rumex crispus*.
— No infection.
Exp. 21. April 30. Teleutospores sown on *Sambucus canadensis*.
— No infection.
Exp. 22. April 30. Teleutospores sown on *Onagra biennis*.
— No infection.
Exp. 23. April 30. Teleutospores sown on *Urtica gracilis*.
— Abundant aecidia May 8.

⁽⁵⁾ Cfr. Bot. Gazette, 35:15. Jan. 1903. The paper of Dr. Arthur here referred to was received while my article was going through the press. He says, "These discoveries led to a careful microscopic study of the two *Carex* rusts, and there appears to be no reason to question that *P. atkinsoniana* and *P. bolleyana* are identical. In the designation of the species it seems necessary on grounds of priority to abandon both these names, however, and it becomes *Puccinia sambuci* (Schw.) Arthur n. n."

Experiment 23 demonstrated the correctness of the identification of the Rust (*Puccinia caricis* [Schum.] Reb.) on *Carex riparia*, whose alternate form is *Aecidium urticae* Schum.

PUCCINIA CARICIS (SCHUM.) REB. FROM CAREX STRICTA.

- Exp. 24. May 2. Teleutospores sown on *Urtica gracilis*.
 — Abundant aecidia May 15.
 Exp. 25. May 2. Teleutospores sown on *Impatiens biflora*.
 — No infection.

The above experimentally verifies the identification of the common Rust on *Carex stricta*, its aecidial form being *Aecidium urticae* Schum.

PUCCINIA ANDROPOGONIS SCHW. FROM ANDROPOGON SCOPARIUS.

- Exp. 11. April 26. Teleutospores sown on *Pentstemon hirsutus*.
 — Spermogonia May 10. (Host killed by Damping-off.)

The material for making the inoculation was kindly furnished by Dr. J. C. Arthur, Lafayette, Indiana. The result is a corroboration of work previously done by him.

PUCCINIA WINDSORIÆ SCHW. FROM TRICUSPIS SESLERIODES.

- Exp. 36. May 11. Teleutospores sown on *Impatiens biflora*
 — No infection.
 Exp. 39. May 11. Teleutospores sown on *Lycopus sinuatus*.
 — No infection.
 Exp. 40. May 11. Teleutospores sown on *Pentstemon pubescens*.
 — No infection.
 Exp. 41. May 11. Teleutospores sown on *Ptelea trifoliata*.
 — Abundant spermogonia May 19; aecidia May 25.
 Exp. 42. May 11. Teleutospores sown on *Ptelea trifoliata*.
 — Spermogonia May 18; aecidia May 25.
 Exp. 43. May 11. Teleutospores sown on *Ptelea trifoliata*.
 — Spermogonia May 18; aecidia May 25.

Thanks are extended to Dr. J. C. Arthur for the culture material and for the host plants used in Experiments 42 and 43. The results obtained when the teleutospores were sown on *Ptelea trifoliata* corroborate the work by the same experimenter. The aecidia obtained were not only excessively abundant but spore-formation continued vigorously for about three weeks.

ÆCIDIUM OSMORRHIZÆ PECK FROM WASHINGTONIA CLAYTONI
 (OSMORRHIZA BREVISTYLIS.)

- Exp. 9. April 26. Aecidiospores sown on *Chaerophyllum procumbens*.
 — Teleutospores May 17.
 Exp. 10. April 26. Aecidiospores sown on *Chaerophyllum procumbens*.
 — No infection.
 Exp. 13. April 27. Aecidiospores sown on *Chaerophyllum procumbens*,
 out doors.
 — No infection.
 Exp. 28. May 5. Aecidiospores sown on *Washingtonia claytoni*.
 — No infection.

- Exp. 29. May 5. Aecidiospores sown on *Washingtonia claytoni*.
— A few sori May 30. (Was this accidental?)
Exp. 30. May 5. Aecidiospores sown on *Washingtonia claytoni*.
— No infection.
Exp. 31. May 5. Aecidiospores sown on *Washingtonia claytoni*.
— No infection.

Though apparent success attended some of the above experiments, none are considered satisfactory. While there is perhaps no doubt but that the Rust is the same on *Chærophylum* and *Osmorrhiza*, American Uredinists have not to my knowledge made cultures for demonstration.

The eight forms of spores so far named in the above list of experiments have yielded positive results (though doubtful in the case last cited above). All those that follow gave negative results; none of these need comment however except the first below, namely, that of *Puccinia peckii* (DeToni) Kellerm.

PUCCINIA PECKII (DETONI) KELLERM. FROM CAREX TRICHOCARPA.

- Exp. 34. May 8. Teleutospores sown on *Lycopus sinuatus*.
— No infection.
Exp. 35. May 8. Teleutospores sown on *Onagra biennis*.
— No infection.
Exp. 36. May 8. Teleutospores sown on *Sambucus canadensis*.
— No infection.
Exp. 37. May 8. Teleutospores sown on *Senecio obovatus*.
— No infection.

It is not explicable that failure should have resulted in case of Experiment 35. But the teleutospores used were not from the same locality as that for the material used in the third set of experiments (No. 26 being successful); the locality was a mile distant and the spores seemed to differ a little in size from the former material. Further study will be devoted to this case. The host was not vigorous which may possibly explain failure when spores of *Aecidium sambuci* were used.

UROMYCES ANDROPOGONIS TRACY FROM ANDROPOGON VIRGINICUS.

- Exp. 61. May 31. Teleutospores sown on *Cimicifuga racemosa*.
— No infection.
Exp. 62. June 21. Teleutospores sown on *Cimicifuga racemosa*.
— No infection (but the host plant not vigorous).

PUCCINI EMACULATA SCHW. ON PANICUM CAPILLARE.

- Exp. 53. May 20. Teleutospores sown on *Lycopus sinuatus*.
— No infection.
Exp. 54. May 20. Teleutospores sown on *Impatiens biflora*.
— No infection.
Exp. 55. May 20. Teleutospores sown on *Boehmeria cylindrica*.
— No infection.
Exp. 56. May 20. Teleutospores sown on *Ptelea trifoliata*.
— No infection.

Exp. 57. May 20. Teleutospores sown on *Sambucus canadensis*.
— No infection.

Exp. 60. May 25. Teleutospores sown on *Impatiens biflora*.
— No infection.

PERIDERMIIUM PINI WALLR. FROM PINUS RIGIDA.

Exp. 48. May 18. Aecidiospores sown on *Lycopus sinuatus*.
— No infection.

Exp. 49. May 18. Aecidiospores sown on *Senecio obovatus*.
— No infection.

Exp. 50. May 18. Aecidiospores sown on *Senecio obovatus*.
— No infection.

Exp. 51. May 18. Aecidiospores sown on *Pentstemon pubescens*.
— No infection.

Exp. 52. May 18. Aecidiospores sown on *Aster sagittifolius*.
— No infection.

Exp. 59. May 22. Aecidiospores sown on *Solidago flexicaulus*, out doors.
— No infection.

UREDIO CHÆROPHYLLI FROM CHÆROPHYLLUM PROCUMBENS.

Exp. 12. April 27. Uredospores sown on *Washingtonia Claytoni*, (*Osmorrhiza brevistylis*), out doors.
— No infection.

ÆCIDIIUM URTICÆ SCHUM. FROM CAREX RIPARIA.

(obtained by inoculation.)

Exp. 58. May 21. Aecidiospores sown on *Carex riparia*.
— No infection.

ÆCIDIIUM NESÆÆ GER. FROM DECODON VERTICILLATUS.

Exp. 64. June 22. Aecidiospores sown on *Carex frankii*.
— No infection.

Exp. 65. June 22. Aecidiospores sown on *Carex asa-grayi*.
— No infection.

ÆCIDIIUM ACTÆÆ OPIZ. FROM ACTÆA ALBA.

Exp. 62. June 21. Aecidiospores sown on *Agropyron repens*, in greenhouse.

— No infection.

Exp. 63. June 21. Aecidiospores sown on *Agropyron repens*, out doors.
— No inoculation.

ÆCIDIIUM SAMBUCI SCHW. FROM SAMBUCUS CANADENSIS.

Exp. 66. June 24. Aecidiospores sown on *Carex lurida*.
— No infection.

Exp. 67. June 24. Aecidiospores sown on *Carex lurida*.
— No infection.

SUMMARY OF SUCCESSFUL INOCULATIONS WITH TELEUTOSPORES.

1. *Puccinia atkinsoniana* Diet. from *Carex lurida* Wahl.; sowings on *Sambucus canadensis* produced spermogonia and æcidia.

2. *Puccinia bolleyana* Sacc. from *Carex trichocarpa* Muhl. (Indiana); sowings on *Sambucus canadensis* sparingly produced spermogonia and æcidia.

(See foot-note (5) on previous page.)

3. *Puccinia peckii* (DeToni) Kellerm., *P. caricis* Auct., from *Carex trichocarpa* Muhl.; sowings on *Onagra biennis* (L.) Scop. (*Oenothera biennis* L.) produced abundant spermogonia and æcidia.

4. *Puccinia caricis* (Schum.) Reb. from *Carex scoparia* Schk.; sowings on *Urtica gracilis* produced abundant æcidia.

5. *Puccinia caricis* (Schum.) Reb. from *Carex stricta* Lam.; sowings on *Urtica gracilis* produced abundant æcidia.

6. *Puccinia andropogonis* Schw. from *Andropogon scoparius* Mx. (Indiana); sowings on *Pentstemon* produced spermogonia. (Host killed by Damping-off fungus).

7. *Puccinia windsoriæ* Schw. from *Tricuspis* (Sieglingia) seslerioides (Mx.) Torr. (*Triodia cuprea* Jacq.); sowings on *Ptelea trifoliata* L. produced abundant spermogonia and æcidia.

NOTES ON SCLEROSPORA GRAMINICOLA.

FRANK LINCOLN STEVENS.

This peculiar fungus began its history in America under the name of *Peronospora graminicola*, being apparently first collected by Pammel at LaCrosse, Wis., a communication to Farlow of Trelease, who noted it in the *Botanical Gazette*, 9:39, in 1884. Next we find it mentioned by Halsted both in the *Bulletin of the Botanical Dept. of Iowa Agricultural College*, April 8, p. 53 and in the *Botanical Gazette* 11:272, with the statement of its great abundance. Again by the same writer in the *bulletin of Ia. Ag. Coll.* '88, p. 99 and in the *Bot. Gaz.* 13:56, with the remark that it is about one tenth as abundant as two years previous. Since then it has been recorded in several western states. It was not, however, until the summer of 1901 that I was aware of its abundance in the east. Collecting trips in central New York then showed the fungus not only abundant but quite destructive to the Pigeon grass, *Ixophorus viridis* (L.) Nash. It was so conspicuous and so abundant that it might be seen at almost any time from the carriage and was of particular destructive form. It could be followed for miles on the bicycle track between Baldwinsville and Syracuse where the over arching grasses had evidently afforded facilities for the spread of the fungus by means of the scorcher's boots and pedals.

Sclerospora was collected from the following localities in New York; Amboy, Van Buren, Syracuse, Ionia, Plainsville, Baldwinsville, Warners, Geddes, Long Branch and Cross Lake. North Carolina College of Agriculture, Raleigh.

A NEW SPECIES OF CALOSTOMA.

BY GEO. F. ATKINSON.

During the autumn of 1902 I received several different species of fungi from Miss M. S. Percival, Rugby, Tenn. Among them were several interesting species of *Calostoma*. Among the first lot sent were four specimens of *Calostoma lutescens* (Schw.) Burnap, and several specimens of *Calostoma ravenelii* (Berk.) Masee. Miss Percival had correctly recognized *C. lutescens*, from the pale yellow inner surface of the exoperidium as it peels off. Although she made diligent search for *C. cinnabarinum** Desv., she found no specimens. Having never before seen *C. lutescens* and having never before examined the spores of *C. ravenelii*, although I had collected during September, 1901, in the mountains of North Carolina, what I took to be this species, I requested from Miss Percival additional material. The second lot received December 5th, contained one more specimen of *C. lutescens*, no specimens of *C. cinnabarinum*, but quite a number of specimens of *C. ravenelii*. Among these there seemed to be great variations in size, the foot stalk varying in length from 1 cm. up to 6 cm. and all the specimens showing numerous adherent warts over the middle and lower portion of the inner peridium. This seemed at the time, quite a remarkable feature of *C. ravenelii*, since all writers state that the foot stalk is short.

On examining the spores of some of the larger specimens, I observed that they were smooth as in *C. ravenelii*, but smaller. At the time I was not especially impressed by this fact, and yet I found that it was constantly recurring to my mind. On January 9th, 1903 I undertook a careful examination of the material and was surprised to find that the specimens with the short foot stalk had large and very variable spores, while those with the long foot stalk had small and little variable spores. At first I thought it would be impossible to separate the two kinds without an examination of the spores. But after some study, I found it quite easy in most cases to separate them by the gross characters alone, even those in which the foot stalk was intermediate, i. e. of the same length in the two species.

The plant with the longer foot stalk and smaller spores I will call *Calostoma microsporum*. The spores are usually oblong, smooth, more rarely elliptical and measure from 6-9 x 3.5-4.5, rarely reaching 10 μ long and 5 μ wide. Burnap, Botanical Gazette, Vol. 23, page 190, 1897, gives no measurement for the spores of *Calostoma ravenelii*, but merely says, "spores elliptical, oblong, smooth." Masee, Ann. Bot. Vol. 2, page 48, 1888, gives the measurement and says: "spores elliptical to oblong, smooth,

*If the earlier specific name given by Persoon is retained this plant would be called *Calostoma callostoma* (Pers.)

colorless, 15-17 x 8-9." While the spores agree, therefore, in the two species in being smooth, and elliptical to oblong, or oblong to elliptical, there is a distinct difference in the size. The spores of *C. ravenelii*, in the specimens from Tennessee and also North Carolina, which I have examined, vary a great deal in size and also in shape, while those of *C. microsporum* do not show such great variations. A study of a single mount from one specimen of *C. ravenelii* from Tennessee gives the following measurements for individual spores; 6 x 7, 6 x 17, 10 x 15, 10 x 21, 12 x 16, 16 x 16, 15 x 18, 19 x 21. In a single mount of *C. ravenelii* from North Carolina the following measurements are taken: 6 x 7, 8 x 10, 12 x 22, 5 x 20. The larger number of the spores, however, in both cases are elliptical, and measure from 10-16 x 5-7. In some specimens nearly all are elliptical. The specimens of *C. ravenelii* from North Carolina which I have examined are those collected by myself on September 17th, 1901, along the roadside between Burnsville and Spruce Pine, at an altitude of about three thousand feet. They were growing in clay soil which contained a large amount of mica particles intermixed. They were the first specimens I had ever seen, although I had collected on the higher elevation at Blowing Rock, large numbers of *Calostoma cinnabarinum* during several seasons. At the time I collected the specimens of *C. ravenelii* it was raining hard. While returning from the Black mountains, a small patch of these plants growing by the roadside at once attracted my attention, and so different were they in size and in general appearance from *C. cinnabarinum* I felt they must be *C. ravenelii*. The spores were not studied until the autumn of 1902. These plants vary from 1-4 cm. high, the foot stalk from .5-3 cm. high. The dehiscence of the exoperidium is somewhat variable, in some specimens quite large patches separate from the inner peridium only remaining slightly attached, especially toward the apex, the patches of the exoperidium often become entirely free, leaving a smooth area around the mouth. The middle and lower half of the inner peridium in these cases is then covered with a few large scaly warts, or in a few cases with a large number of smaller ones. In some specimens the entire endoperidium is covered, except here and there are exposed places where the outer peridium has cracked and become partially free. In the specimens from Tennessee of *C. ravenelii*, the plants vary from 2-4 cm. high, the foot stalk from 1-3 cm. long. Nearly all of the specimens show a smooth area over the upper part of the inner peridium around the mouth, while on the lower and middle part there is in almost all cases a large number of smaller warts.

In *C. microsporum*, the gross characters of the plants resemble very much those of *C. ravenelii*, except as stated above. On the average the foot stalk is longer, ranging from 3 cm. to 6 cm. and the peridium is somewhat larger. The smaller specimens of *C. microsporum*, however, are very near in size to the

larger specimens of *C. ravenelii*. In fact, it might be said, as far as the size is concerned, in these forms which might be termed intermediate, there is no difference. Yet, with the number of the plants mixed as they were in the collection, after having studied a few of each kind, I was able to separate the remainder into two lots and all of those I examined thus separated by the eye, agreed in microscopic characters with those which had formerly been examined representing each species. The specimens of the same size in the two species do show, even in the dry specimens, some slight differences, which can be seen better than described. In the first place the inner peridium of *C. ravenelii* is lighter in color than that of *C. microsporum*, although in some cases there is scarcely any difference. In the second place, the mouth of *C. ravenelii* is not quite so prominent as that in *C. microsporum*. In the latter, the teeth are larger, longer, and as far as I have examined, are only vermilion colored on their inner faces. In *C. ravenelii*, however, in many specimens, the outer face of the teeth is vermilion as well as the inner face. In some specimens, however, this is not the case, only the inner face is vermilion in color, but then as above stated, the teeth are usually not so prominent. This comparison has been made only with the specimens of the two species from Tennessee. All of the specimens which I have collected in North Carolina were much lighter in color. All of these show the less prominent teeth, and in many specimens the teeth are vermilion color without and within.

The specimens of *C. ravenelii* from Tennessee resemble very much *Calostoma lurida* (Berk.) Massee from Australia, (Ann. Bot. Vol. 2, p. 43-44, figs. 19-20, 1888.) The resemblance is shown in the size of the plant and general size of the spores, and in the fact that the exoperidium breaks up into small blackish granules over the middle and lower portion. In *C. lurida*, however, there is no vermilion color. The inner faces of the teeth as well as the edges being black.

This new species should be looked for and carefully studied in the field in the fresh condition. It is quite likely that still additional characters might be observed. The following preliminary diagnosis will serve to characterize the species:

CALOSTOMA MICROSPORUM Atkinson n. sp. Plants 4-7 cm. high, foot stalk 3-6 cm. by 1-2 cm., cylindrical or ventricose or enlarged below, sometimes compressed, rarely two foot stalks joined throughout the entire length. Peridium oval, 10-15 mm. broad; teeth 5-7, prominent, vermilion colored on their inner faces; exoperidium separating into numerous small hard adherent warts, covering the middle and lower surface of the endoperidium, usually entirely separating from the upper surface leaving a smooth area on the inner peridium around the mouth. Spores white, smooth, oblong, some rarely elliptical, 6-10 x 3.5-5 μ . Pro-

toplasm usually homogeneous, sometimes granular, often showing a tendency to be constricted at the middle, perhaps because of a clear area at this point. Rugby, Tennessee. Collected by M. S. Percival, 1902.

Botanical Department, Cornell University.

January 9, 1903.

OHIO FUNGI. FASCICLE VI.

W. A. KELLERMAN, OHIO STATE UNIVERSITY.

The following species are included, occurring on the hosts named:—

101. *Coniosporium arundinis* (Corda), Sacc., on *Phragmites phragmites* (L.) Karst.
102. *Melasmia hypophylla* (B. et Rav.) Sacc., on *Gleditsia triacanthos* L.
103. *Mollisia dehnii* (Rabenh.) Karst., on *Potentilla monspeliensis* L.
104. *Peridermium pini* Wallr., on *Pinus rigida* Mill.
105. *Polyporus resinosus* (Schrad.) Fr., on rotten wood.
106. *Puccinia fusca* (Pers.) Winter, on *Anemone quinquefolia* L.
107. *Puccinia helianthi* Schw., on *Helianthus ambiguus* (T. & G) Britt.
108. *Puccinia muhlenbergiae* Arth. & Holw., on *Muhlenbergia mexicana* (L.) Trin.
109. *Puccinia muhlenbergiae* Arth. & Holw., on *Muhlenbergia diffusa* Willd.
110. *Puccinia myrrhis* Schw., on *Washingtonia claytoni* (Mx.) Britt.
111. *Puccinia myrrhis* Schw., on *Chaerophyllum procumbens* (L.) Crantz.
112. *Puccinia myrrhis* Schw., on *Chaerophyllum procumbens* (L.) Crantz.
113. *Puccinia myrrhis* Schw., on *Washingtonia claytoni* (Mx.) Britt.
114. *Puccinia myrrhis* Schw., on *Washingtonia longistylis* (Torr.) Britt.
115. *Puccinia polygoni-amphibii* Pers., on *Polygonum emersum* (Mx.) Britt.
116. *Pucciniastrum agrimoniae* (DC.) Diet., on *Agrimonia parviflora* Soland.
117. *Septoria œnotheræ* (Lasch) West., on *Onagra biennis* (L.) Scop.
118. *Septoria verbascicola* B. & C., on *Verbascum blattaria* L.
119. *Uromyces burrillii* Lagerh., on *Scirpus fluviatilis* (Torr.) Gr.
120. *Uromyces toxicodendri* Berk. & Rav., on *Rhus radicans* L.

Thanks are extended to the numerous mycologists who in various ways have kindly assisted in preparing the data for labels and determining material. Credit on each label is given the collector.

Corrections (or new labels) are included for Nos. 1, 3, 18, 64, and 88, previously issued.

The date of issue of Fascicle VI, Nos. 100-120, is Feb. 14, 1903.

101. Coniosporium arundinis (Corda) Sacc.

On Phragmites phragmites (L.) Karst.

Columbus, Ohio.

Aug. 6, 1902.

Coll. W. A. Kellerman.

"Coniosporium arundinis (Cda.) sacc.

Gymnosporium.

"1. G. arundinis: Taf. VIII. fig. 1. immersum, dein denudatum lividum; sporis ovalibus lentiformibus vel subrotundis, margine depresso diaphano luteo-livido, nucleo obovato vel globoso convexo fusco. Magnit. spor. 0,000250 p. p.

Wohnt auf fäulenden Rohr- und Grasshalmen im Frühjahr; Kre bei Prag." A. C. I. Corda. Icones Fungorum Hucusque Cognitorum, 2:1. 1838.

102. Melasmia hypophylla (B. et Rav.) Sacc.(*Leptostroma* B. et Rav. sine diagnosi.)

M. gleditschiæ E. & E.

On Gleditsia triacanthos L.

Athens, Athens Co., Ohio.

Sept. 3, 1902.

Coll. W. A. Kellerman.

"Melasmia Gleditschiæ, E. & E. — On living leaves of Gleditschia triacanthos, Concordia, Mo., October, 1887. Rev. C. H. Demetrio. Perithecia hypophyllous, flattened, rugulose, $\frac{1}{2}$ -1 mm. in diameter, thickly scattered over the part of the leaf occupied, which turns dark brown; sporules oblong, hyaline, $3-5 \times 1-1\frac{1}{4}\mu$, continuous, borne on densely fasciculate basidia $10-12\mu$ long. Found also in Louisiana by Rev. A. B. Langlois and at Manhattan, Kansas, by Kellerman & Swingle (No. 1206)." J. B. Ellis and B. M. Everhart, Journal of Mycology, 4:45-46. 1888.

103. Mollisia dehnii (Rabenh.) Karst.

On Potentilla monspeliensis L.

Steubenville, Jefferson Co., Ohio.

July 3, 1902.

Coll. W. A. Kellerman.

"Peziza Dehnii Rabenhorst."

"P. gregaria, subsessiles, obovata, livido-fusca, subhyalina, tenax, extus glabriuscula (pube tenerrima adpressa), disco applanato margineque arrecto undulato concolore."

"Die lebenden jungen and alten Stämme und Zweige der Potentilla norvegica oft ganz dicht überziehend. In der Jugend ist der Pilz geschlossen, verkehrt eiförmig, $\frac{1}{8}$ - $\frac{1}{6}$ - $\frac{1}{4}$ Linie im Durchmesser, später ausgebreitet mit flacher, bis $\frac{1}{2}$ Linie breiter Scheibe and einem steif aufgerichteten Rande, am Grunde in einen kaum merklichen Steil zusammen gezogen, von fester Substanz durchscheinend gelbbrauner Farbe und glatter Oberfläche, nur bei starker Vergrößerung einen zarten angedrückthaarigen Ueberzug zeigend.".....etc. L. Rabenhorst, Botanische Zeitung, 1:12. January 6, 1843.

104. Peridermium pini Wallr.

(Aecidium pini Pers.)

On Pinus rigida Mill.

Sugar Grove, Fairfield Co., Ohio.

May 31, 1902.

Coll. W. A. Kellerman.

"Lycoperdon Pini gregarium oblongum compressum aurantiacum, apice dehiscens, pulvere concolore. Fig. nostr. 12.

"Oblongum obtusum sessile and parasiticum lateribus compressis, apice irregulariter dehiscens. Recens aurantiacum, siccum albido-flavescens est. Semen aurantiacum est; siccitate etiam flavescit.

"In ramis junioribus emortuis Pini sylvestis in der Jungfernheide prope Berolinum, sed rarius, vere observavi." Observationes Botanicae. Auctore Carol. Ludov. Willdenow, in Magazin für die Botanik. Herausgegeben von Job. Jacob Römeri and Paulus Usteri. 1788. Viertes Stück. Utile dulci, Zurich, bey Johann Fuefsly. Page 16.

"Aecidium pini Pers.

"Ae. oblongo-compressum pallidum, seminibus aurantiis. Willden. bot. Mag. 4. t. 4f 12." Caroli a Linne, Systema Naturæ, 2^a: 1473. 1791. Ed. 13. Auct. Jo. Frid. Gmelin.

105. Polyporus resinosus (Schrader.) Fr.

(Boletus resinosus Schrad.)

On rotten wood.

Columbus, Ohio.

Oct. 28, 1902.

Coll. W. A. Kellerman.

"B. *rubiginosus*, pileo convexo farinaceo rubiginoso, poris teretibus obtusis albidis.

"Hab. ad Fagi aliarumque aborum truncos emarcidos in silvat. Ducat. Brunsvicens.

"Pileus 2-quatuor uncias diametro excedens, semunciam et ultra crassus, farina rubiginosa, difficile, detergenda, conspersus.

"Pori lineares, minutissimi, teretes, obtusi, primum albidis, dein pallescentes.

"Substantia pallida; exsiccata dura, suberosa." Auctore Henrico Adolpho Schrader, Spicilegium Floræ Germanicæ. 1794.

"B. *resinosus*, pileo convexo rugoso resinoso castaneo, poris teretibus obtusis albidis.

"Hab ad Fagi silvestris truncos cæsos putridos in silvaticis Ducat. Brunsvic.

"Pileus diametro longitudinali 4-6 uncias excedens, convexus, crassus, rugosus, materia resinosa, saturate fusca, marginem versus paulo dilutiori, per ficitatem corrugante, oblitus.

"Pori longiusculi, minuti, teretes, obtusi, primum albi, dein pallescentes.

"Substantia suberosa, tenacissima, fomiti apta, dilute pallida.

"Affinis B. *fomentario* et *igniario* Linn. ab utroque vero satis distinctus." Auctore Henrico Adolpho Schrader, Spicilegium Floræ Germanicæ, 171. 1794.

106. *Puccinia fusca* (Pers.) Winter.

On *Anemone quinquefolia* L.

Carey, Wyandot Co., Ohio.

May 4, 1902.

Coll. Thos. Bonser.

"*Aecidium fuscum*.

"*Ae. semnibus fuscis*. *Persoon.*.. Caroli a Linne, *Systema Vegetabilium*, 1473. Cura Jo. Frid. Gmelin." 1791.

R. Relhan as author has been credited by Winter, and his description is also given below, but Persoon not Relhan (sec. Holway, Jour. Mycol. 8:172. Dec. 1902), should be cited as original author.

"*Plantula haec de qua variae opiniones nuper habitae sunt, dum quibusdam ex insectorum ictu, aliis vero e morbo oriri credebatur, in foliis Anemones nemorosae parasitat; praesertim paginem inferiorem, nonnunquam, sed rarius superiorum, vel ipsa petala utrinque occupans; initio pallide lutea, orbiculata, sparsa, numerosa in uno folio 600. Semina, epidermide sub qua latent demum fracta, nuda apparent, filis destituta, non cohaerentia, saturate fusca; quibus tandem excussis, theca, membranacea, suborbiculata, marginibus laceris, vacua persistit. Plantae contiguae saepe in vetustiore statu confluunt. Folia in quibus *Aecidium* parasitat, crassiora, rigidiora, filicum quodammodo aemula evadunt; pauca tamen specimina inveni ne minima quidem injuria visibili affecta."*

R. Relhan, *Florae Cantabrigiensi Supplementum Tertium*, 36. 1793.

107. *Puccinia helianthi* Schw.

On *Helianthus ambiguus* (T. & G.) Britt. (*H. giganteus ambiguus* T. & G.)

Edgerton, Williams Co., Ohio.

Sept. 15, 1902.

Coll. W. A. Kellerman.

Supplement to No. 10.

108. *Puccinia muhlenbergiae* Arth. & Holw.

On *Muhlenbergia mexicana* (L.) Trin.

Buckeye Lake, Perry Co., Ohio.

Oct. 23, 1902.

Coll. W. A. Kellerman and James McOwen, Jr.

"*Puccinia muhlenbergiae*, *sp. nov.*

"*Puccinia windsoriae* Burrill non Schw., Bull. Ill. Lab. Nat. Hist. 2: 197.

"O. I. *Spermogonia* and *aecidia* unknown.

"II. III. Sori hypophyllous or sparingly amphigenous, prominent, oblong or linear-oblong, soon naked, ruptured epidermis inconspicuous. II. Uredosori light brown, pulverulent; uredospores globose or globose-elliptical, 22-30 μ in diameter, wall thin, yellowish brown, closely and distinctly echinulate, pores about 5, scattered. III. Teleutosori chocolate-brown; teleutospores obovate or oblong obovate, dark brown, 19-27 by 30-40 μ , not constricted at the septum, narrowed somewhat toward the base, side walls rather thin, apex rounded and somewhat thickened, pedicel hyaline, tinted, stout, firm, about the length of the spore." J. C. Arthur and E. W. D. Holway, Bulletin from the Laboratories of Natural History of the State University of Iowa, 5:317. Oct. 1902.

109. *Puccinia muhlenbergiae* Arth. & Holw.On *Muhlenbergia diffusa* Willd.

Buckeye Lake, Perry Co., Ohio. Oct. 23, 1902.

Coll. W. A. Kellerman.

Supplement to No. 109.

110. *Puccinia myrrhis* Schw.

Aecidiospores.

On *Washingtonia claytoni* (Mx.) Britt.

Cincinnati, Ohio. April 12, 1902.

Coll. Walter H. Aiken.

"*Aecidium Osmorrhizae* *n. sp.* Spots yellowish, frequently on the midveins; peridia hypogynous, clustered or seriated along the veins, slightly elevated, with the margin subentire, incurved; spores subglobose, yellow, becoming pale, 1-1000 in. in diameter; spermogonia central, on the same side." Charles H. Peck, Annual Report of the New York State Museum, 24:92. 1871.

111. *Puccinia myrrhis* Schw.

Uredospores only.

On *Chærophyllum procumbens* (L.) Crantz.

Columbus, Ohio. April 20, 1902.

Coll. W. A. Kellerman.

"*Puccinia myrrhis*, L. v. S.

"*P. emaculata*. *Acervis crebris minutis, epidermide rupta cinctis, pulvinatim applanatis. Sporidiis laxissimis luteofuscis.*" L. D. de Schweinitz, Transactions of the American Philosophical Society, Philadelphia, 4:296. 1834.

112. *Puccinia myrrhis* Schw.

Teleutospores only.

On *Chærophyllum procumbens* (L.) Crantz.

Columbus, Ohio. May 20, 1902.

Coll. W. A. Kellerman.

Supplement to No. 111.

113. *Puccinia myrrhis* Schw.

Teleutospores.

On *Washingtonia claytoni* (Mx.) Britt.

Fernwood, Jefferson Co., Ohio. July 4, 1902.

Coll. W. A. Kellerman.

Supplement to No. 111.

114. *Puccinia myrrhis* Schw.

Teleutospores.

On *Washingtonia longistylis* (Torr.) Britt.

Fernwood, Jefferson Co., Ohio. July 4, 1902.

Coll. W. A. Kellerman.

Supplement to No. 111.

115. *Puccinia polygoni-amphibii* Pers.On *Polygonum emersum* (Mx.) Britton.

Buckeye Lake, Licking Co., Ohio. Oct. 29, 1902.

Coll. W. A. Kellerman and James McOwen, Jr.

Supplement to No. 92.

116. *Pucciniastrum agrimoniae* (DC.) Diet.On *Agrimonia parviflora* Soland.

Wauseon, Fulton Co., Ohio. Sept. 10, 1902.

Coll. W. A. Kellerman.

"*Puccinia potentillae*: subrotunda sessilis nigra, sporulis cylindricis obtusis.

"Pustulas in inferiore folii pagina sistit nigras sparsas. *Sporulae* eadem fere sunt forma, ac in sequente specie, sed mucrone destitutae sunt; septulis ut plurimum tribus distinctae sunt. D. C. H. Persoon, Synopsis Methodica Fungorum, 228. 1801.

"*Uredo potentillarum*.

"*z. Agrimoniae eupatoriae*.

"Je ne vois aucune différence digne d'être remarquée entre les urédos qui attaquent toutes les plantes que je viens de désigner, et je les regarde tous comme de simples variétés les uns des autres. Cette espèce est une des plus communes." A. P. DeCandolle, Flore Française, 6:81. 1815.

117. *Septoria œnotheræ* (Lasch) West.On *Onagra biennis* (L.) Scop.

West Alexandria, Preble Co., Ohio. July 4, 1901.

Coll. W. A. Kellerman.

"D [epazea] *Oenotheræ*. Nachtkerzen—I.

"Peritheciën rundlich, schwarz, eingesenkt, auf einem braunen Flecken. Lasch I. I. N. 369.

"Auf den Blättern der *Oenothera biennis*." Dr. L. Rabenhorst, Deutschlands Kryptogamen Flora, 1:138. 1844.

118. Septoria verbascicola B. & C.On *Verbascum blattaria* L.

Columbus, Ohio.

July 15, 1902.

Coll. W. A. Kellerman and F. J. Tyler.

"Septoria verbascicola, B. & C. [sine diagnosi].

"Spots round, dry, thin, 1-3 millim. in diameter, border broad, dark purple; perithecia black, but few in a spot, clustered, innate, slightly prominent, epiphyllous, but visible beneath, 80-85 μ in diameter; sporules hyaline, filiform, curved, 20-40 μ x 1½ μ " George Martin, Journal of Mycology, 3:78. July 1887.

119. Uromyces burrillii Lagerh.

(Uromyces junci Burrill)

On *Scirpus fluviatilis* (Torr.) A. Gray.

Buckeye Lake, Perry Co., Ohio.

Oct. 23, 1902.

Coll. W. A. Kellerman.

"U. scirpi, Burrill.

"II., III. Amphigenous, spots brown, indeterminate; sori long covered by the epidermis, minute and rounded, or larger, oblong, sometimes confluent end to end, forming clusters up to one-fourth of an inch long, nearly black. Spores among the teleutospores few, irregularly elliptical, yellowish brown, sparsely echinulate, 15-20 by 27-36 μ . III. Spores clavate-elliptical, widest at centre, mostly pointed, brown, apex darker, and thickened, 18 by 32-42 μ ; pedicel stout, subhyaline, about the length of the spore." T. J. Burrill, Parasitic Fungi of Illinois, Part I, p. 168, 1885, in Bulletin of the Illinois State Laboratory of Natural History, Vol. II.

120. Uromyces toxicodendri Berk. & Rav.On *Rhus radicans* L.

Cedar Point, Erie Co., Ohio.

Sept. 22, 1902.

Coll. W. A. Kellerman.

"Uromyces toxicodendri. B. & R. — Effusus rufus; sporis ovatis obtusis apiculatisve lineis brevibus notatis.

"On the stem, petioles and leaves of *Rhus toxicodendron*. Aiken. Ravenel. No. 1688.

"Effused, rufus; spores ovate, obtuse or apiculate, marked with short lines somewhat like the sporidia of *Ascobolus furfuraceus*." M. J. Berkeley, Grevillea, 3:56. Dec. 1874.

"Pileolaria brevipes. B. & Rav. — Pedicellis brevibus; sporis depresso globosis.

"On leaves of *Rhus toxicodendron*. Cotoosa Springs, Georgia. Ravenel. No. 1722. Alabama, Beaumont. No. 4020.

"Forming little specks on the underside of the leaves; stem short, flexuous; spores at first globose, with three coats, then depressed with a central nucleus, .00114 in. diameter." M. J. Berkeley, Grevillae, 3:58. Dec. 1874.

Corrected Label; cfr. Bot. Gaz. 35:19. Jan. 1903.

1. Puccinia impatientis (Schw.) Arth.
Æcidiospores.

Corrected Label; cfr. Bot. Gaz. 35:15. Jan. 1903.

3. Puccinia sambuci (Schw.) Arth.
Æcidiospores.

Through inadvertency an erroneous label, both as to name and description, accompanied specimen No. 18, which therefore is to be discarded and the following substituted:—

18. Stannaria americana Mass. & Morg.

On Equisetum robustum R. Br.

Logan, Hocking Co., Ohio.

Oct. 8, 1894.

Coll. W. A. Kellerman.

"Stannaria americana Masee & Morgan n. sp. —

"Erumpent, gregarious or crowded in clusters of three or four, sessile or with a very short stem-like base, about $\frac{1}{2}$ mm. across and high, thin, translucent, margin scarious, uneven, entirely pale amber when dry, concave; asci clavate, apex rounded, not blue with iodine, 8-spored, 170 x 15-16 mic.; spores irregularly 2-seriate, hyaline, smooth, continuous narrowly elliptic-fusiform, often slightly inaequilateral, 2-guttulate, 26-29 x 7-8 mic.; paraphyses slender, tips slightly clavate, often branched; excipulum and cortex formed of very slender septate hyphae running from base to margin.

"On dead stems of Equisetum hyemale, Preston, O. Entire fungus delicate, thin, soon collapsing. Readily distinguished from *S. equiseti* in the much larger asci and spores." A. P. Morgan, Journal of Mycology, 8:183. Dec. 1902.

Please cancel and discard label for No. 64 and substitute therefor the following:—

64. Cercospora kellermani Bubak.

On Althæa rosea Cav. (Cultivated.)

Columbus, Ohio.

June 9, 1901.

Coll. W. A. Kellerman.

"Cercospora kellermani Bubák n. sp.—Flecken auf beiden Blattseiten, unregelmässig, eckig, von den Blattnerven begrenzt, olivenbraun undeutlich graulich umrandet, oft zusammenfliessend, bis 1 cm. im Durchmesser. Fruchträger auf beiden Blattseiten, büschelweise, schlank, wenig verbogen, bis 150 μ lang, 4-5 μ breit, oft fast schon vom unteren $\frac{1}{4}$ — $\frac{1}{3}$ entfernt gezähnt (bis 6 Zähne), mit 3-5 Querwänden, olivenbraun, manchmal an der Spitze heller. Conidien nadelförmig, 50-150 μ lang, 4-5 μ breit, mit 5-15 Querwänden, gerade oder wenig gekrümmt, hyalin, gegen den Scheitel allmählig schweiförmig verschmälert," Francis Bubák, Journal of Mycology, 9:3. Feb. 1903.

Corrected Label; cfr. Bot. Gaz. 35:15. Jan. 1903.

88. Puccinia sambuci (Schw.) Arth.
Puccinia atkinsoniana Dietel.

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Alphabetical List of Articles, Authors, Subjects, New Species and Hosts, New Names and Synonyms.

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W. A. KELLERMAN.

KEY to N. A. species of *Limacium*, see *Limacium*, Key. . . .

Discard "Key to N. A. species of *Coprineae*, see" etc., substitute:—

KEY to N. A. species of *Coprineae*, see *Coprineae*, Keys. . . .

Discard "Key to N. A. species of *Coprinus*," etc., substitute:

KEY to N. A. species of *Coprinus*, see *Coprinus*, Key. . . .

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- UREDIO rubella Spreng. in part, *syn. of Puccinia rubella, q. v.*
- UREDIO striola Strauss, *syn. of Puccinia rubella, q. v.*
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- USTILAGO andropogonis-hirtifolii Henn., *syn. of Sphacelotheca andropogonis-hirtifolii q. v.*

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NOTES FROM MYCOLOGICAL LITERATURE. IV.

W. A. KELLERMAN.

MUSHROOMS, A. M. LONGENECKER, PLANT WORLD, 5:213-218, 2 pl., November 1902, is an interesting illustrated popular account of this group of eight or nine hundred species, of which "at least 650 have been proven edible."

IN SUPPLEMENTARY NOTES ON THE ERYSIPTACEÆ, ADDENDA, Bull. Torr. Bot. Club, 29:647-9, Nov. 1902, E. S. Salmon mentions two interesting species of *Uncinula* from Japan, and refers again to the reported occurrence of the American *Sphærotheca mors-uvæ* in Belgium (an error to be expunged), and in Russia; in respect to the latter, Mr. N. A. Mossolow, of St. Petersburg, says "there is no reason to believe that the parasite could have been introduced into Russia from America."

ONE HUNDRED NINETY EIGHT NEW SPECIES, AND THREE NEW GENERA OF FUNGI, were described (according to list in index) in the Journal of Mycology, volume 8, 1902.

IN A PAMPHLET OF FIFTY PAGES, by O. Penzig et P. A. Saccardo, entitled Diagnoses Fungorum Novorum in Insula Java collectorum, Series Tertia, 1902, extracted from MALPIGHIA 1901, there are described 164 new species and varieties; and 13 new genera are established.

The following mycological titles are taken from the programs of the Daily Announcement of the Washington Meeting of the American Association for the Advancement of Science, and affiliated societies, Dec. 27, 1902 to Jan. 3, 1903. Problems in the Study of Plant Rusts (illustrated), J. C. Arthur; Uredinous Infection: Suggestions and Experiments, W. A. Kellerman; A Preliminary Synopsis of the North American Species of the Genus *Mitrella*, E. J. Durand; The Genera of Polyporaceæ, W. A. Murrill; Cultures of Uredineæ in 1902, J. C. Arthur; Some Undescribed Structures in *Synchytrium decipiens*, F. L. Stevens; The Nutrition of Certain Edible Basidiomycetes (illustrated.), B. M. Duggar; Types of the Linnean Genera of Fungi, F. S. Earle; Plum Blight Caused by the Pear Blight Organism, L. R. Jones and L. P. Sprague; Systematic Relations of the Genera of the Agaricaceæ, F. S. Earle; The Bacterial Flora of the Oyster's Intestine, C. A. Fuller; Studies upon the Cytolytic Enzymes produced by Soft Rot Bacteria, L. R. Jones; A Mould Pathogenic to Lobsters, F. P. Gorham; A Fat-Splitting *Torula* Yeast Isolated from Canned Butter, L. A. Rogers; Nitrophilic Bacteria of Soils, F. D. Chester; Rhizobia in Economic Agriculture, Albert Schneider; Increasing the Virulence of the Tubercle Forming Bacteria in the Leguminosæ, George T. Moore; The

Relative Viability of *B. coli* and *B. typhosus* under Certain Conditions, Stephen De M. Gage; and Further Evidence of the Apperent Identity of *B. coli* and Certain Lactic Acid Bacilli, S. C. Prescott.

MYCOLOGICAL NOTES, NOS. 11 AND 12, were issued by C. G. Lloyd, December 1902, and generously distributed to mycologists. The notes are numbered 191-199 in No. 11, and 200-213 in No. 12. As usual these are neatly gotten up, very interesting and extensively illustrated. Full page, consecutively numbered separate plates now accompany the Myc. Notes. In No. 11 the notes are miscellaneous (two by Dr. Farlow), a new form of the *Geaster saccatus* is recognized; No. 12 is devoted to the *Bovistæ* — the species of *Bovista* and *Mycenastrum*; a new form of *M. arium* is recognized; the genus *Catastoma* will appear in the next issue.

UREDINEÆ NOVÆ, J. T. LINDROTH [of which 6 are North American], and eine arktisch-alpine *Rhabdospora* [an exhaustive study of *R. cercosperma*], are printed in *Meddelanden från Stockholms Högskolas Botaniska Institut*, Band IV, 1901.

PROFESSOR F. S. EARLE'S KEY to the North American species of *Cortinarius* is continued in *Torreyia*, 2:180-3, Dec. 1902.

DR. ALEXANDER ZAHLBRUCKNER GIVES THE LATIN DIAGNOSES of one new genus (*Hassea*), 17 new species, and 2 new varieties of Lichens, under the title *Diagnosen neuer und ungenügend beschriebener kalifornischer Flechten*, in *Beihefte zum Botanischen Centralblatt*, 13:149-163. 1902.

IN THE PROCEEDINGS OF THE INDIANA ACADEMY OF SCIENCE 1901, (Published in 1902), Mycologic articles are as follows:— Notes on Apple Rusts (H. H. Whetzel); Notes on the Genus *Stemonitis* (H. H. Whetzel); The Germinative Power of the Conidia of *Aspergillus oryzae* (Mary F. Hiller); Spore Resistance of Loose Smut of Wheat to Formalin and Hot Water (William Stuart); Some Additions to the flora of Indiana — Plant Rusts (William Stuart); and A Collection of *Myxomycetes* (Fred Mutchler).

AN EXTENDED STUDY OF TWO FUNGOUS DISEASES OF THE WHITE CEDAR (*Cupressus thyoides*), namely *Gymnosporangium bisseptatum* and *G. ellisii*, is given in the May No. of the Proceedings of the Academy of Natural Sciences of Philadelphia, pp. 461-504, plates XXII and XXIII, 1902. The belief is expressed that the fungi cause marked metabolic changes in the stem of the host, accompanied by the accumulation of resins and other substances, products of increased cell activity. A full and conveniently arranged tabulation of the characters, hosts and distribution is given of the several species of the genus *Gymnosporangium*.

THE INTERESTING AND VALUABLE REPORT OF THE STATE BOTANIST 1901, Charles H. Peck, has been published as New York State Museum Bulletin 54 (Botany 5) and includes pp. 931-984, plates K & L, and 77-81, November 1902. New species, 16 in number, and new varieties, 7 in number, are described. Another commendable feature is the full technical and popular descriptions of 11 species of Edible Fungi. These are illustrated in natural color on 2-page plates. Copies of this Report are offered for sale at 40 cents. Address Director N. Y. State Museum, Albany.

P. & H. SYDOW, IN FASCICULUS I, VOLUMEN I, MONOGRAPHIA UREDINEARUM (pp. 1-192) give the diagnoses of 302 species of Puccinia (298 on Compositæ and 4 on Calyceraceæ), of which 63 are described as new. Of the new species 13 belong to North America.

UNDER THE TITLE OF EINIGE PILZFUNDE aus der Umgegend von Berlin, in Verhandlungen des Botanischen Vereins der Provinz Brandenburg, 1901, 43:105-6, 1902, W. Ruhland after describing two new species of fungi, reports the occurrence of Peck's American *Massaspora cicadina* on a cicada collected in Bredower Forst the preceeding year.

PROFESSOR BESSEY NOTES THE DISEASE of potatoes that causes the fibro-vascular bundles to turn brown (Science N. S. 15:274, 14 Feb. 1902), and under his direction experiments were conducted by Mr. J. A. Warren, who showed the disease to be due to *Stysanus stemonites* (Pers.) Corda. This is the first record of this fungus in this country and the first report of its connection with the Brown Disease of Potatoes.

A SUMMARY of what is known in regard to the most serious diseases of the sugar beet is given by C. O. Townsend in Report No. 72, U. S. Dept. Agr., Progress of the Beet-Sugar Industry in the United States in 1901. The items are Damping Off, Curly top or blight, Leaf spot, Leaf scorch, Beet scab, Brown rot or *Rhizoctonia* rot, and Root gall.

IN A BOOK OF 323 PAGES recently issued (1902) by the Calumet Publishing Co., Pittsburg, Pa., entitled Powdered Vegetable Drugs, the author (Albert Schneider) briefly discusses [3 pages] Bacteria and Hyphal Fungi as causes modifying the characteristics of Vegetable Powders.

MINNIE REED IS THE AUTHOR OF A PAPER entitled Two New Ascomycetous Fungi parasitic on Marine Algæ, University of California Publications, Botany, 1:141-164, pls. 15-16, 20 Nov. 1902. The species described, studied and figured are *Guignardia ulvæ* and *G. alaskana*. But few cases have been reported of the association of fungi with marine algæ either in a symbiotic or a

strictly parasitic relation. While by no positive statement maintained, it is nevertheless remarked that "perhaps instead of being a symbiotic relation, where each is benefitted, it may be a case of extreme relation, where the ascomycete is the aggressor and receives all the benefit at the expense of the alga."

STEREUM QUERCINUM, A NEW SPECIES, is according to M. C. Potter (Trans. Eng. Arboricult. Soc. 1901-2) the cause of Canker of Oak trees, common in the north of England.

A GOOD BRIEF OUTLINE OF THE INVESTIGATIONS (published in Bul. Min. Agr. France) ON A NEW BACTERIAL DISEASE OF THE POTATO by G. Delacroix, is given in the Experiment Station Record, 14:365, Dec. 1902. The disease is due to *Bacillus solaninicola* and it attacks the tomato as well. The characters of the disease are described. The conditions for infection seem to be a humid Spring which is late and cold followed suddenly by very hot, dry weather.

BEITRAG ZUR KENTNISS DER ROSTPILZE, Centralblatt f. Bakt. Par. u. Infektionskr. Zweite Abt. 9:796-804, 841-4, 6 u. 15 Dez. 1902, Ernst Jacky, includes inoculation experiments with *Puccinia bardanæ*; *P. cirsii-lanceolati* Schroet. und *P. cirsii-eriphori* Jacky; *P. violæ* (Schum.) DC.; *P. helianthi* Schw.; and *P. prenanthis* (Pers.) Lindr. Especially to be mentioned is this here first experimentally demonstrated fact that the Violet Rust is an aut-eu-puccinia; the author also shows that *P. helianthi* is an aut-eu-puccinia—the pycnidia, æcidia, uredo, and teleutospores produced (by sowings of teleutospores from *Helianthus annuus*) on *H. annuus*, *H. cucumerifolius*, and *H. californicus*, but the species not able to live on *H. tuberosus*, *H. maximiliani*, *H. multiflorus*, *H. scaberrimus*, and *H. rigidus*.

THE MYCOLOGICAL ARTICLES IN HEDWIGIA, Band XLI, Heft 6, 1902, are as follows: *Fungi S. Paulenses* II. a cl. Puttemans collecti, von P. Hennings; *Battareopsis Artini* n. gen., sowie andere von Professor Dr. G. Schweinfurth in Aegypten 1901-1902 gesammelte Pilze, von P. Hennings; *Sceptromyces Opizi* Corda (*Botrytis sceptrum* Corda) ist eine Conidienform von *Aspergillus niger* Rob., von C. Engelke; Neue Beobachtungen über die Vegetations-Formen des Mutterkornpilzes *Claviceps purpurea* Tulasne, von C. Engelke; Ueber den Artenbegriff von *Uredo bistortarum* DC. in Flore Française Vol. VI S. 76, von P. Magnus; and Ueber die richtige Benennung der *Hyalospora Aspidiotus* (Peck) P. Mag., von P. Magnus.

UEBER *VENTURIA CRATAEGI* N. SPEC., R. ADERHOLD, is an illustrated article, published in Berichte der Deutschen Botanischen Gesellschaft, 20:195-200, pl. 9, 23 Apr. 1902. As a synonym, is mentioned *Venturia chlorospora* (Ces.) Karst. p. parte. The conidial form is *Fusicladium cratægi* Adrh. n. sp.

The host is *Cratægus oxycantha*: Leaves exposed through the Winter for the perithecia; and fruit in Fall and Spring, perhaps also in Summer.

DESCRIPTIONS OF AMERICAN UREDINEÆ, IV, by J. C. Arthur and E. W. D. Holway, Bull. Lab. Nat. Hist. State Univ. Iowa, 5:311-334, pl. 1-9, Oct. 1902, apply to American plant-rusts inhabiting species of Gramineæ belonging to the sections of Agrostideæ and Chlorideæ, with their accompanying aecidia so far as known. Sixteen species are included, *Puccinia muhlenbergiæ* being new. Only one of the species has had its full cycle of development traced, namely *Puccinia fraxinata* (Lk.) Arthur of which *Aecidium fraxini* Schw. is the alternate form. The original diagnoses, also new and very full description and critical notes, as well as illustrations are given, as in previous numbers of this series. The article is based on the material in the authors' *Uredineæ Exsiccatae et Icones*.

IN BEIBLATT ZUR HEDWIGIA, 41:(169), (177), (179), Sept.—Okt. 1902, (Heft 5.) we find the following mycological titles: Eine neue norddeutsche Phalloidee (*Anthurus borealis* Burt var. n. *Klitzingii* P. Henn.), von P. Hennings; Einige Uredineen aus Japan, von P. Dietel; Die Befruchtung von *Albugo Lepigoni* und einigen *Peronospor*een, von W. Ruhland.

ARTICLES RELATING TO FUNGI in Hedwigia, Heft 4, 1902 (p. 164, & 167) are Einige neue deutsche *Pezizaceen*, von P. Hennings; Einige neue *Cordiceps* — Arten aus Surinam, von P. Hennings. In the Beiblatt to the same are, (p. 145) Bemerkungen zu Dietel's Ausführung über die Gattung *Uropyxis*, von P. Magnus; and (p. 146) *Phlebia Kriegeriana* P. Henn. n. sp., von P. Hennings.

COLLECTING AND PRESERVING FUNGI, UREDINEÆ, is briefly treated by E. W. D. Holway in Jour. Appl. Micr. & Lab. Meth. 5:2075-6. 1902. It is suggested that a portfolio with many thin sheets and but few dryers be used — though a botanical box is convenient in the wind or where very large quantity is to be taken. Leaves of grasses and sedges to be cut in 4 inch pieces; some ligules and inflorescences should be collected; search specially for the uredo stage also; collect aecidia when not too old, use but little pressure in drying them. Determine hosts accurately. Arrange the specimens in a large herbarium according to the host plant, putting different genera on different sheets. Have a set of mounted slides — Dr. Arthur's method, i. e. spores mounted dry, the cover glass fastened with a narrow strip of gummed paper.

FRANK LINCOLN STEVENS IN STUDIES IN THE FERTILIZATION OF PHYCOMYCETES, Bot. Gaz. 34:420-5, Dec. 1902, says that "the general bearing of the cytological evidence on the re-

lationship of *Sclerospora* is to emphasize its affinity to the *Peronosporaceæ* rather than to the *Albuginaceæ*, and to indicate its specialized rather than primitive character. *Sclerospora*, as shown by the combined evidence of the double investment of its oospore, the character of its conidiophores, and its cytology, probably separated early from the main line of the *Peronosporaceæ*, at a time much later than the divergence of the *Albuginaceæ* from the *Peronosporaceæ*.

UREDINEÆ EXSICCATÆ ET ICONES, FASCICLE IV, J. C. ARTHUR AND E. W. D. HOLWAY, Dec. 1902, contains 49 packets, with a like number of photo-engraved drawings and heliotype reproductions from photographs, representing 15 species. It is needless to commend this admirable and to every student of Uredineæ indispensable set of specimens. The photographs (heliotype reproductions) have heretofore been unequalled. The signs the authors use here and elsewhere are, O for spermatia, I for æcidiospores, II for uredospores, III for teleutospores, and X for amphispores; the same printed in small type indicate few sori or the spores scattered among other spores.

A MONOGRAPH OF THE (7) NORTH AMERICAN SPECIES OF *GANODERMA*, by William Alphonso Murrill, is given in the Bull. Torr. Bot. Club, 29:599-608, October 1902. It is the "lucidus" group of *Polyporus*; the genus *Ganoderma* being established by Karsten in 1881, based upon the laccate character of pileus and stipe. The range was extended in 1887 by Patouillard to include all forms of *Polyporaceæ* with colored spores, adhering tubes and shining crusted pilei. Mr. Murrill describes as new five of the seven species included in the monograph.

CEPHALOTHECIUM ROSEUM HAS PROVED TO BE A TRUE PARASITE and the cause of an apple rot of great economic importance, according to H. J. Eustace, *Science*, N. S. 16:747-8, Nov. 7, 1902. In some sections thousands of barrels of apples have been ruined by it. *Fusicladium dendriticum*, unusually common, ruptures the epidermis and thus furnishes a means of entrance for the *Cephalothecium*.

THE MYCOLOGICAL ARTICLES in the 3^e Fascicule, Tome 18, Bulletin de la Société de France, 15 Août 1902, are Observations sur quelques-unes des principales espèces d'Amanites (Boudier); Sur deux Maladies du Vanillier — sur les formes primaires du *Calospora vanillæ*; *Uromyces joffrini* nov. sp. (Delacroix); Sur le mode de Développement du Champignon du "Noir des Bananes" — *Gloeosporium musarum* (Delacroix); Nécessité de la présence d'une bactérie pour obtenir la culture de certains Myxomycetes (Pinoy).

AN INDEX BIBLIOGRAPHIQUE DES PRINCIPAUX MÉMOIRES de Mycologie in 1901 is given in the Bulletin de la Société Mycologique de France, 18:217-226. 1902.

SOME IMPORTANT MYCOLOGICAL ARTICLES published in 1902 in the Berichte der Deutschen Botanischen Gesellschaft are: Walter Busse, Ueber den Rost der Sorghum-Hirse in Deutsch-Ostafrika; P. Magnus, Ueber die in den knolligen Wurzelauwüchsen der Luzerne lebende Urophlyctis; P. Magnus, Ueber ein function der Paraphysen von Uredolagern, nebst einem Beitrage zur Kenntniss der Gattung Coleosporium.

AN INSTRUCTIVE DISCUSSION, by F. C. Harrison and M. Cumming, of the Bacterial Flora of Freshly Draw Milk, is published in the Journal of Applied Microscopy and Laboratory Methods, 5:2029-2038, Nov. 1902. The work done to date is reviewed and full notes are given on the several species, one being hitherto undescribed.

THE THIRD ARTICLE IN THE SERIES of The Bacterial Flora of Freshly Drawn Milk, by F. C. Harrison and M. Cumming, is printed in Jour. Appl. Micr. & Lab. Meth. 6:2130—1, Jan. 1903. But little more than half a dozen species were obtained (3 cows). The authors refer to the fact of the germicidal properties of freshly drawn milk, allied to the similar bactericidal property of blood: it must also exist in milk in the udder and may inhibit or prevent the rapid multiplication of adventitious bacteria.

THE INSTRUCTIVE AND INTERESTING PRESIDENTIAL ADDRESS by J. C. Arthur, before the Botanical Society of America at Washington, Jan. 1, 1903, is published in the Bulletin of the Torrey Botanical Club (30:1—18. Jan. 1903). The development of our knowledge of the Uredineæ is traced, the culture work done first by DeBary then Oersted noticed, the experiments in this country by Farlow, Thaxter and Halsted mentioned, the extensive and valuable labors of Eriksson of Stockholm and Klebahn of Hamburg emphasized and the numerous problems confronting the culturist traced with competent grasp. All mycologists will be profited in reading the address. Those who study or even collect Uredineæ ought to heed these statements: "No rust can be considered apart from its host; the parasitism is so closely wrapped up in the evolution of the species that to ignore it would be folly. Many collections of Uredineæ are rendered nearly worthless for study because the collector neglected to determine the host, or to include material in the collection by which the student could determine it."

THE EFFECT OF BLACK ROT ON TURNIPS is the title of Bulletin 29, Bureau of Plant Industry, U. S. Dept. Agr., author

Erwin F. Smith, issued Jan. 17, 1903. It is a series of photomicrographs, accompanied by an explanatory text. The 13 admirable plates are reproduced by the Heliotype Co., of Boston. It is claimed that the Bacterium (*Pseudomonas campestris*) is capable not only of destroying the middle lamellæ, but also of slowly dissolving the cell wall proper.

THE BACTERIA OF THE SOIL IN THEIR RELATION TO AGRICULTURE, by Frederick D. Chester, is set forth in extenso in Bulletin No. 98, Dept. Agr. Commonwealth of Pennsylvania, 1902. Such topics as soils, their value and origin; number and distribution of soil bacteria; chemical changes produced by bacteria in the soil; the elaboration of plant food; assimilation of atmospheric nitrogen; and related matters indicate a valuable and useful treatise, full and up to date, covering 88 pages, concluding with a bibliography of 105 titles.

DOTT. G. SCALIA HAS PUBLISHED IN AGRICOLTURE CALABRO-SICULO, XXVII, Nr. 24, an article, Di Una Nuovo Malattia dell' *Asclepias curassavica* Spr., in which is proposed the new genus, *Oidiopsis*, "ab *Oospora* hyphis distinctis differt; *Oidio* omnino simillima sed endophyta."

DR. VON SCHRENK REPORTED TO THE ACADEMY OF SCIENCE OF ST. LOUIS January 5, 1903 [Science, N. S. 17:188, 30 Jan. 1903,] that Perley Spaulding had found two weeks earlier perfectly formed asci and ascospores of the Bitter-rot fungus (*Gloeosporium fructigenum* Berk.) in the cankers induced on apple limbs by inoculation — thus demonstrating for the first time and beyond question, that the fungus produces its perfect fruit in the cankers. Since the asci are evenascent "it is not at all improbable that many of the supposed pycnidial spores found in both the natural and artificially produced cankers were really ascospores."

IN AN ARTICLE IN TORREYA (3:6—7, Jan. 1903,) entitled Vacation Observations.—III, Francis E. Lloyd mentions a case of large patches of the moss *Polytrichum commune* being killed by a fungus — probably a *Mucor*-like organism; also that the death of the capsules with some amount of distortion of *Dicranum scoparium* and *Polytrichum ohioense* was induced by a myxomycete. He found that *Hypomyces lactiflorum*, parasitic on *Lactarius*, is able to propel its spores $1\frac{1}{2}$ inches or more.

THE MOBILITY OF RHIZOBIUM MUTABILE IS CONSIDERED by Albert Schneider in Contributions to the Biology of Rhizobia, Bot. Gaz. 35:56—8. Jan. 1903. Some of the conclusions are: the species is non-motile in most neutral media, especially in solid neutral media; it is decidedly motile in acid media, whether these media are liquid or solid; motile Rhizobia are smaller, and more uniform in size and form.

ASPERGILLUS NIGER AND PENICILLUM GLAUCUM were used by Arthur L. Dean in Experimental Studies on Inulase, Bot. Gaz. 35:24—35. Jan. 1903. The inulase of these fungi does not pass into the culture medium; it is therefore an endo-enzyme. It acts most vigorously in a medium containing 0.0001 normal acid (H_2SO_4). Alkalies hinder the activity of inulase.

CLEAR AND USEFUL SUGGESTIONS ON CULTURE METHODS WITH UREDINEÆ are given by Mark Alfred Carleton in Jour. Appl. Micr. & Lab. Meth. 6:2109—2114, Jan. 1903. These are arranged under the following topics: Methods of Germination; Selection of Materials; Methods of Inoculation; and Suggestive Studies.

ERRATA.

Some unfortunate errors are found in Prof. Morgan's article in the last No. (vol. 8, 1902) and changes should be made as follows, suggested by the author: Paragraph No. 3 (p. 179) change 1834 to 1885; No. 55 (p. 184) erase the last line "*Peziza æruginascens*, etc."; No. 59 (p. 185) erase the second line, substitute *Lachnea aurelia* Gillet, Disc. Fr. 1879; No. 60, erase the second line, Substitute *Belonidium auratum* Saccardo, Mich. I. 1877; No. 85 (p. 188) in fourth line change "*algida*" to *albida*; No. 88, "*Martins*" should be *Martius* and "*stenostorna*" should be *stenostoma*; No. 94 (p. 189) in second line change "2-3" to $\frac{2}{3}$. In seventh line change "8-8" to 8-9.

On page 15 (same vol.) "*Puccinia*" should be *Puccinia*; p. 76, the line beginning "*Lycopodium*" should be stricken out; p. 97, "*Tolysporium*" should be changed to *Tolyposporium*, and "*Tracy Syd.*" etc., changed to *Tracya Syd.* etc.; p. 117, "*Polyporis*" should be changed to *Polyporus*; p. 125, "*E. V. Wilcox*" should be *E. N. Wilcox*; p. 231, "*Granularia rudii*" should be *Granularia rudis*; and p. 239, change "*Corprineae*" and "*Corprinus*" to *Coprineae*, etc.

JOURNAL OF MYCOLOGY

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W. A. KELLERMAN, PH. D., COLUMBUS, OHIO.

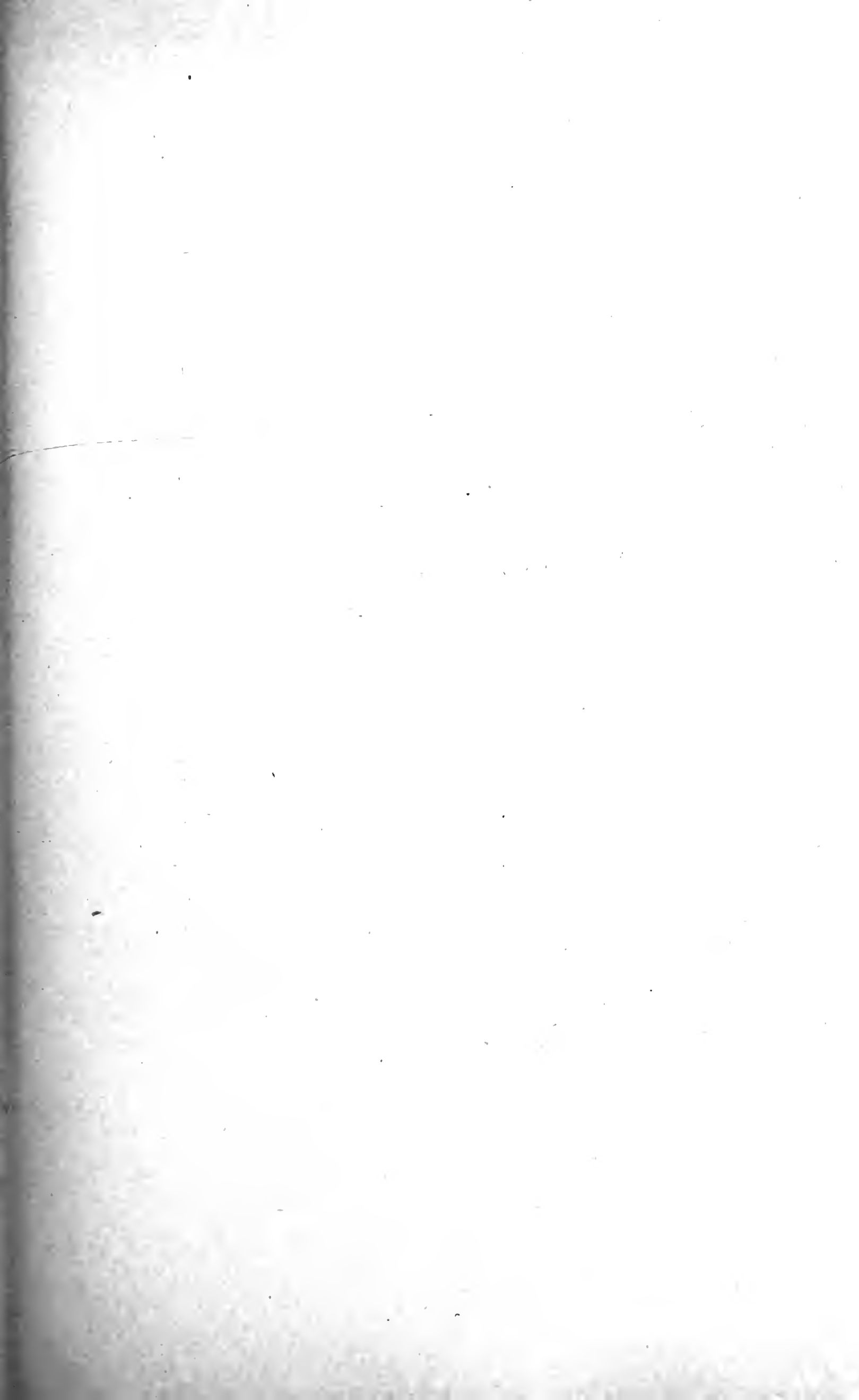
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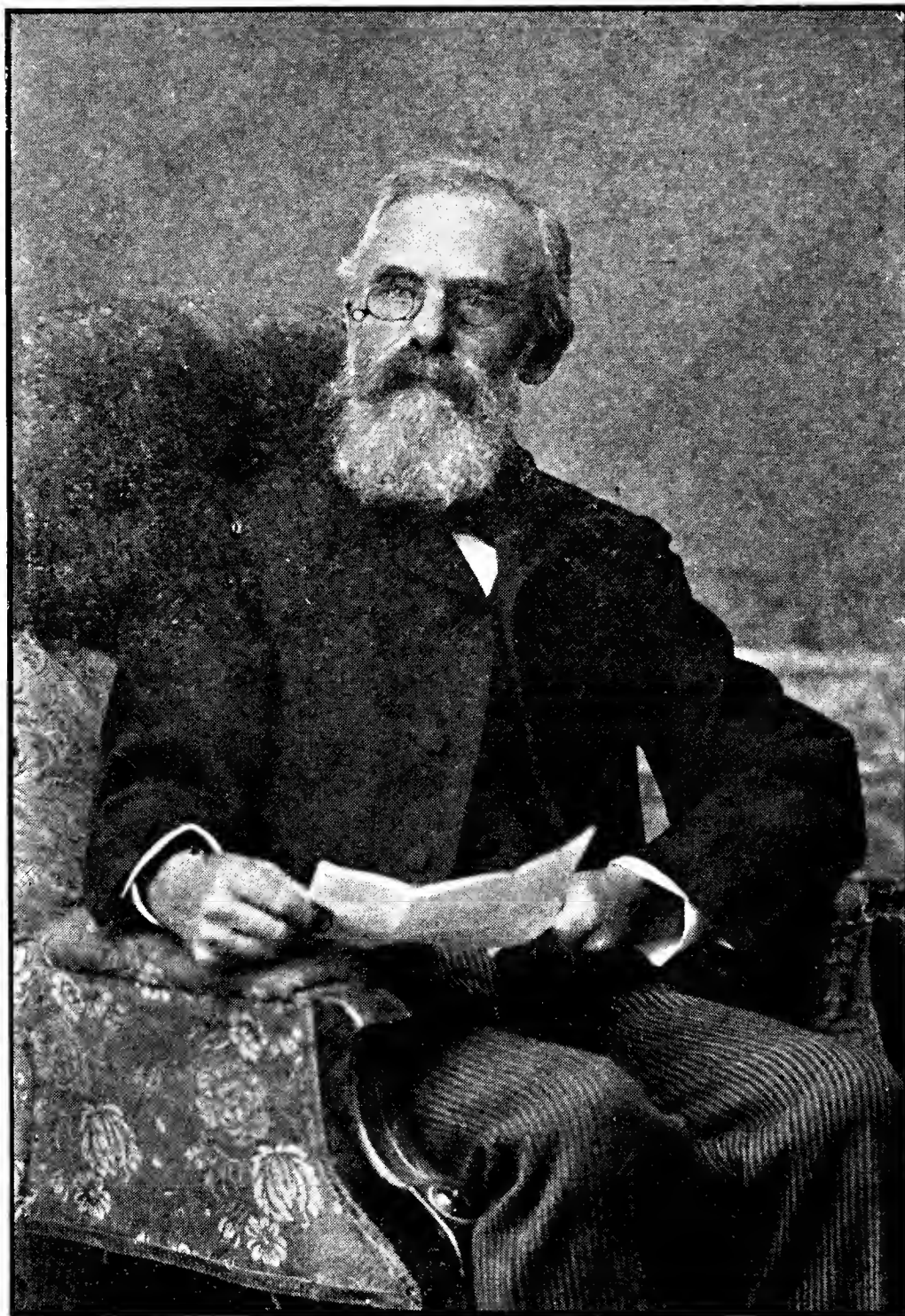
It is much to be regretted that in spite of the fact that the Nos. of the Journal of Mycology have been enlarged from 48 pp. to 80 pp. it is yet necessary that important papers generously offered by mycologists have to be postponed or declined. Apology to contributors is offered—but something else will have to be done; see below.

Thanks are extended to Mr. P. L. Ricker and Rev. J. M. Bates for corrections (additions) to the Index to North American Mycology. It is earnestly hoped that all authors will kindly notify me in case omissions or inaccuracies are observed by the authors of articles or others.

The intention to issue yearly about two *Reprints* of the Index to North American Mycology, *printed on one side of the page* for convenient use in making a card index, etc., does not prove to be adequate in the case—since a fuller index (more cross-references, etc.) results in a bulkier contribution. Besides, it is desirable to keep the Index abreast with the rapidly growing mycological literature. Therefore about three or more *Reprints* will be made each year; but subscribers are not expected to forward payment until 4 Reprints (at 25cts. each) are issued, yet credit will be entered whenever payments in whatever amounts are kindly forwarded.

It may as well be stated at once that the Journal of Mycology will be enlarged next year and perhaps issued bi-monthly. As the basis of the present price was about 48 pp. per No., the enlargement next year will call for a rate of \$2.00 per volume. But the enlargement can not altogether be postponed till next year, and therefore immediately *after the issue of the December No.* 1903, the price of the present volume, and also of the preceding one will be \$2.00.





*Yours very truly -
S. M. Tracy -*

Journal of Mycology

VOLUME 9 — MAY 1903

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ON A RUST OF THE CULTIVATED SNAPDRAGON.

BY W. C. BLASDALE.

During the summer of 1895 the writer found near San Leandro, California, the uredo stage of a rust growing on cultivated forms of *Antirrhinum majus*. Somewhat later the same rust appeared on some plants of the same host growing in my own garden at Berkeley. Both uredo and teleuto stages were produced and the fungus ultimately destroyed the entire group of plants. Specimens were submitted to Mr. E. W. D. Holway and to Dr. Dietel, and the species was published (*Hedwigia*, 36:298, 1899), by them under the name of *Puccinia Antirrhini*. Since that year the fungus has appeared every season in which an attempt was made to raise this annual, and in every case destroyed the plants shortly after they had reached the flowering stage. Further observations have shown that the disease is a common one in the region about San Francisco Bay, though I have no knowledge of its occurring elsewhere in the State. Since there is no record of a similar disease in other parts of the world, the question at once arises as to where it originated, since the period of time during which the snapdragon has been cultivated in California is comparatively limited. Thus far only four species of rusts which inhabit scrophulariaceous genera have been found in the State. These are *Puccinia wulfeniae* D. & H. on *Wulfenia cordata*, P.

rufescens D. & H. on *Pedicularis semibarbata*, *Aecidium collinsiae* E.W. & Ev. on *Collinsia bicolor* and an *Aecidium* (species as yet undertermined) on *Pentstemon confertus*. The two species of *Puccinia* present decidedly different characters from those of the species to which the snapdragon disease is due and it is very improbable that the latter is correlated with either of the two *Aecidia*. The first mentioned species has been found but once in the Bay Region and then in very small amounts, the latter is known only from the Sierra Nevada Mountains. Further than this, badly infected snapdragon plants have been placed in close proximity to patches of various species of *Collinsia*, growing in the Botanic Garden of the University of California, for two seasons but the *Aecidium* has never appeared. Attempts to infect various other species of *scrophulariaceous* genera with the disease have been successful in three instances only. During the past season it was found that plants of the native *Antirrhinum vagans*, grown from seed, were attacked with nearly the same degree of destructiveness as the cultivated species. Also plants of *Linaria reticulata* and *L. amethystina* were attacked by the disease, but to a much less degree than the other species. No differences could be detected in the characters of the fungus grown on the four different host plants. Presumably then the snapdragon rust originated on the wild form of *Antirrhinum* but thus far the disease has never been found on plants growing spontaneously though diligent search has been made for it whenever the opportunity was offered. The only alternative is to assume that it is a case of adaption of a species from a host plant belonging to a different order. The destructive character of the disease would render it wise to guard against introducing it into other regions.

A NEW SPECIES OF SIROTHECIUM.

A. P. MORGAN.

In the *Symbolae ad Mycologiam* XX, p. 105, 1887, Karsten founded a new genus *Sirothecium* upon a single species, see Saccardo, *Sylloge* X, p. 270. This genus is more than merely a "phaeosporous *Sirococcus*;" it is probably more closely related to certain species of *Hormococcus* or *Trullula*. The following species rests well in Karsten's new genus.

SIROTHECIUM NIGRUM Morgan sp. nov.—Perithecia superficial, gregarious, subglobose, astomous, glabrous, black; the wall thin and fragile, dehiscing irregularly; the enclosed mass of spores brown. The hyphae wholly abjoined into long slender,

branched chains of spores, which readily fall apart. Spores cylindric, obtuse at both ends, smoky-pellucid, 5-6x2.5 mic.

Growing on wood and bark of *Acer*, under the bark; Preston, Ohio. The perithecia 100-150 mic. in diameter, loosely attached to the matrix, scattered or often closely crowded.

A SERIES OF SPECIMENS ILLUSTRATING NORTH AMERICAN USTILAGINEAE.

A. B. SEYMOUR.

In 1884, under the direction and encouragement of Professor T. J. Burrill, I prepared a systematic account of the Ustilagineae of Illinois, based chiefly on my collections of 1881 and 1882 and intended to be co-ordinate with the "Illinois Uredineae." But no botanical publications in this series were issued for many years and this manuscript with others remained untouched. Finally Mr. G. P. Clinton took up the study of the group, and with Professor Burrill's approval I consigned my interests to the former.

In nearly twenty years that have elapsed Mr. Clinton has been able to double the list of Illinois species. In addition to his years of study and his economic writings on the group in Illinois, he has recently spent two years at Harvard, where he has completed an exhaustive monograph of the North American species. His preliminary account was published in the *Journal of Mycology* for October, 1902.

The series of specimens to which reference is here made, was published under date of January 1, 1903, to illustrate Dr. Clinton's monograph. The specimens are those accumulated by both of us through our own collecting and by exchanges. They have all been verified and put in envelopes by Dr. Clinton. Fifteen other botanists have contributed specimens.

Of the 100 numbers, 63 are from Illinois, 19 from Massachusetts. Maine, New York and Mississippi each supply two. Jamaica and eleven states contribute one each.

Dr. Clinton's paper records 181 species and varieties with numerous hosts and localities. This fascicle of specimens contains 66 species and varieties representing 100 hosts or localities. Evidently much remains to be done in a future fascicle.

All botanists are invited to contribute additional material for distribution.

The main series of specimens entitled *Economic Fungi* is planned to illustrate plant diseases from a practical standpoint. One hundred copies are prepared and nearly every important

College and Experiment Station is a subscriber. Botanists have supported it generously, sending valuable specimens illustrating new practical results.

The supplements are intended to be scientific regardless of practical bearings. Fifty copies are prepared. Three supplements have been issued: A.—Phycomycetes; B.—Uredineae; C.—Ustilagineae.

It is desired to add to each of these and to prepare others. Much material is already in hand; more is desired. Botanists are especially requested to co-operate in the preparation of sets to illustrate their special studies as Dr. Clinton has done.

DICTYOSTELIEAE OR ACRASIEAE.

A. P. MORGAN.

Mr. Edgar W. Olive in the Cryptogamic Laboratory of Harvard University, has been studying the Acrasieæ. He has kept various members of this group of organisms in cultivation and under observation for five or six years. The results are embodied in a pamphlet of sixty pages or more, which is an admirable example of careful and critical work.

The order Acrasieæ is represented by a small group of mostly coprophilous organisms, comprising seven genera and twenty species. Knowledge of them began with the discoveries of Brefeld, Cienkowski and Van Tieghem.

By Mr. Olive the number of species previously recorded has been nearly doubled and what is of more importance the life-histories of the species observed by him have been patiently followed out and their relation to kindred organisms clearly established.

The life-cycle of the Acrasieæ is separable into two well marked periods, one of vegetation and one of fructification. In germination the protoplasm of each spore issues forth and passes its vegetative stage as an amoeba; it absorbs nutriment, increases in size and becomes greatly multiplied by successive divisions. After a more or less prolonged independent existence as vegetating individuals the amoebæ congregate toward certain centers and form aggregations for the purpose of fructification. These colonies or *syncytia* develop into fructifications which show increasing complexity of structure from the slightly differentiated sessile aggregations of the simpler species to the complex stalked sori of those most highly developed. In the stalked forms the scramble for place and position among the amoebæ is something remarkable; for those forced to the center and com-

pelled to take their places as rounds in the ladder, there does not appear to be any further use; only upon the most exalted individuals is there conferred immortality. The ultimate purpose is the production of naked masses of resting bodies, the *spores*; these spores in some of the species are naked protoplasts, in others they are regularly invested with a cell-wall. The varying details in the development of the fructifications furnish the characteristic differences for the genera and species.

Mr. Olive's studies make it clear that there is neither homology nor analogy between the *plasmodium* of the Myxomycetes and the *syncitium* of the Acrasieae. The plasmodium is a complex protoplast, the cytoplasm of the individual amoebæ fusing completely. The syncitium is a compound protoplast, an aggregation of individual protoplasts; at any stage in its development the colony may be separated into its component members. In the one there is continuous nuclear division, in the other no nuclear changes have been observed. Furthermore, the plasmodium is the final vegetative condition, while the syncitium is the initial fructifying stage.

In SAPPINIA the resting stage consists either of a single encysted individual or of many individuals encysted in masses at the ends of projections of the substratum. It may be regarded as a transitional form from the true Amoebæ. There are two species.

In GUTTULINOPSIS the spore-clusters or *sori* are usually stalked and composed of spores that have no cell-wall. This genus is represented by three species.

GUTTULINA differs from Guttulinopsis in that the spores have a definitive protective cell-wall. It contains four species.

The genus ACRASIS is quite abnormal. It is defined as a chain of spores terminating a simple stalk. The spores in the single species are globose, the surface roughened and of a deep violet color; they are 10-15 mic. in diameter, much larger than in other species of the order. Its habitat is quite different too, on the sediment of beer. We much regret that Mr. Olive was unable to find this singular organism.

DICTYOSTELIUM is the principal genus both in the character of its development and in the number of its species. It has tall stalked sori sometimes more than a centimeter in height; the spores are invested with a cell-wall. There are seven species, two or three of them quite common.

POLYSPHONDYLIUM is a branched form of Dictyostelium. It is possible that the distinction is not great enough to warrant the retention of the two as distinct genera. There are three species.

In COENONIA the sorus is globular, borne at the summit of a stalk, which is dilated into a sort of cupule, in which the sorus is supported. One species.

Four of these genera and thirteen species occur in this country and have been cultivated by Mr. Olive.

For the method of work and detail of observations, the reader must seek the splendid essay. The interest of it is all lost in such a bare outline as we must necessarily give; hence any dissent from the original must be taken as mere suggestion and any fault-finding as extremely superficial.

On page 493, first line *Arcyriaceae* is probably intended instead of *Physaraceae*. The species of *Arcyria* and also some species of *Hemiarcyria* fulfill the conditions mentioned.

The physiological phenomena are as a general thing presented cautiously; we are, however, rather disposed to cavil at the statement on page 489, and elsewhere that "the individuals during the fructifying period *probably in response to some chemotropic stimulus*, unite to form colonies." Every physiological process is dependent upon both internal and external factors; the specific shape and nature of an organism are inherited properties; from an acorn nothing but an Oak can develop. See Pfeffer.

Our dislike of the *pseudo* prefix is apparent. We may have to tolerate the venerable *pseudopodium*, but not the rest. This evasive prefix is, however, in common use and its employment by Mr. Olive is not original. The term *syncitium*, we are aware, has been otherwise made use of, but its application both by Vines and Verworn, for example, seems to us superfluous; it is eminently applicable to the assembling amoebæ of the Acrasieæ.

Finally, where shall we place these organisms? In their active assimilating and reproductive stage, they are simple Amoebæ. It would be interesting to know how they come to their peculiar habitat; did they survive in the drinking water or did they crawl out upon the land, catching at straws by the way? In view of this habitat their appearance in their present shape cannot be extremely ancient. The Sporozoa are not near akin to them. Their relation to the Amoebidæ is closer than is that of the Myxomycetes. The fact is, both are short divergent members from the advancing animal line.

The Vegetable Kingdom is not in line with any of the Protozoa. It is safe to claim that the bacterial cell is the lowest cell-form that can without question be called a plant; from this all other vegetation has been derived. The systematic succession between plant and animal does not seem to us so well established, as some would have us think; there is much confusion in this respect, among the lower organisms. As having a bearing upon this subject, we can here only refer to Thaxter's Myxobacteriaceæ.

A HISTORICAL REVIEW OF THE GENERA OF THE
POLYPORACEAE.*

BY WILLIAM ALPHONSO MURRILL.

It is not my intention to lengthen the present paper with a formal introduction. The subject of "generic types" is not unknown to American botanists and the historical method here adopted leaves little to be explained. The principles by which I have been chiefly guided are also quite well known, having been stated and explained by Underwood in "A Review of the Genera of Ferns proposed prior to 1832" (Mem. Torrey Club, 6:250). and restated by Banker in "A Historical Review of the proposed Genera of the Hydnaceæ," which appeared in the July number of the current volume of the Torrey Bulletin. After a brief statement regarding the establishment of each genus in its chronological order, an alphabetical summary will be made in which available generic names will be distinguished from those which for any reason are considered untenable. In order to make the species names better understood in cases where an early name is restored, the name assigned to the given species by Saccardo in his Sylloge is placed in parenthesis after the earlier name.

1. AGARICUS (Dill.) L. Sp. Pl. 1176. 1753. — Based on *A. quercinus* L. Fl. Suec. 380. n. 1082, 1745, where this species is directly referred to Dillenius' genus *Agaricus*. Since Linnæus states that he adopted the genus *Agaricus* from Dillenius and this species is the only one directly cited by Linnæus as belonging to the genus, it must stand as its type.

2. CERIOMYCES Batarr. Fung. Hist. 62. Pl. 29. f. A. B. 1755. — Founded upon one species of *Polyporus* and several species of *Boletus* as these terms are used in Saccardo. The first binomial species listed is *C. crassus* Batarr., which must be considered the type of the genus, thus placing *Ceriumyces* among the *Boletaceæ*.

3. KORDERA Adans. Fam. 2:10. 1763. — Based on Vaill. Bot. Par. pl. 8. f. 1. 1727. The species here figured is not binomial and not definitely determinable.

4. MISON (Grae.) Adans. Fam. des Pl. 2:10. 1763. — Founded on *Agaricum* Mich. t. 62, 63 and briefly described. These two plates being very different and being so recognized by Micheli (Nov. Pl. Gen. 121. 1729), who represents on them two different sections of *Agaricum*, the name *Mison* properly belongs with the first which is *Polyporus igniarius* (L.) Fr. The genus name, however, cannot hold because the name of its type species as cited was not binomial.

* Read before the Botanical Society of America at Washington, December, 1902.

5. *AGARICON* Adans. Fam. 2:10. 1763.—Founded on Tournefort's pl. 330 and Micheli's pl. 60, the first of which represents *P. igniarius* (L.) Fr. The genus is, however, not established upon a binomial and moreover the name is preoccupied by *Agaricus* L.

6. *PORIA* (Brown) Adans. Fam. 2:10. 1763.—Based on Mich. Pl. 61. f. 2. 1729, a polynomial and as yet undetermined species. Hill used *Poria* for one of the large punk fungi in his Nat. Hist. 2:40, 1751 and he also had a genus *Porium* (l. c. p. 28) which seems synonymous with *Boletus*. In none of these cases is the genus properly established.

7. *POLYPORUS* (Mich.) Adans. Fam. 2:10. 1763.—Based on *P. leptcephalus* (Jacq.), which stands first in Micheli's list of species under his new genus *Polyporus* in Nov. Pl. Gen. 129. 1729. When Adanson restored the name he referred to five of Micheli's figures representing central-stemmed plants, all of which were congeneric, one being *P. leptcephalus* (Jacq.). The genus was thus restored by Adanson in its original sense, but does not hold because not founded on a binomial species.

8. *STRIGLIA* Adans. Fam. 2:10. 1763.—Founded on Batarra's Pl. 38, which represents several common species of *Agaricus*, the first being *A. quercinus* L. The genus is thus synonymous with *Agaricus*, even if considered properly established without a binomial basis.

9. *SESIA* Adans. Fam. 2:10. 1763.—Founded on *S. hirsutum* (Schaeff.) [*L. sæpiaria* (Fr.)] figured in two positions by Vaillant in Bot. Par. pl. 1. fig. 1-2. 1727. The specimens were collected on the timbers of a boat at St. Cloud. The drawing is well done and leaves no doubt as to the identity of the plant. The lack of a binomial, however, prevents the proper establishment of the genus.

10. *SERDA* Adans. Fam. 2:11. 1763.—Founded on Vaill. Bot. Par. pl. 1. fig. 3. 1727. This figure is not so clear as the first two but it very closely resembles an old resupinate form of *Sesia hirsutum* (Schaeff.) [*L. sæpiaria* (Fr.)]. Add to this the fact that the plant was collected at the same time on the same host and I think one is justified in regarding *Serda* as a synonym of *Sesia*, the two being separated by Adanson because one was resupinate and the other was not.

11. *CELLULARIA* Bull. Herb. France. 9. pl. 414. 1788.—Based on *C. cyathiformis* Bull., a single species, which is apparently the undeveloped form of some other plant, possibly *P. versicolor* (L.) Fr. or *Lenzites betulina* (L.) Fr. Owing to the uncertainty regarding the identity of this plant it cannot be accepted as the type of a genus.

12. *CERATOPHORA* Humb. Fl. Friberg. 112-114. 1793.—Erected upon a monstrous variety of *Boletus annulatus* Schæff (*Trametes odorata* (Wulf.) Fr. called *Ceratophora fribergensis*

by Humboldt, the genus name referring to its branched appearance. The normal form, common in Europe, was probably unknown to Humboldt at this time since it is not listed in his work.

13. *XYLOMETRON* Paulet, *Icon. Champ.* pl. 3. f. 1-4. 1793.—Based on *X. lobatum* and two other species, none of which are determinate.

14. *PYREIUM* Paul. *Icon. Champ.* pl. 5. f. 1-3. 1793.—Based on *P. giganteum* Paul. [*Xylostroma giganteum* (Paul.) Tode] and some doubtful species of the Polyporaceæ. Since the first species is determinate, it stands as the type.

15. *POLYPORUS* (Mich.) Paul. *Icon. Champ.* pl. 13. 1793.—The genus *Polyporus* as established by Micheli in *Nov. Pl. Gen.* 129. pl. 70-71. 1729, was such a natural division and so clearly distinguished that it remained intact for over a century. Its nomenclatorial type was *P. leptcephalus* (Jacq.) Fr. and associated with this species were some of the most common and well known members of the family. Unfortunately, however, Linnæus retained the name *Boletus* for all pore-bearing fungi and those mycologists who adopted Micheli's genus failed to establish it according to modern ideas. Adanson, for example, only cited Micheli's figures and listed no properly named species, Haller used polynomials, and Scopoli in his introduction listed no species at all under *Polyporus*. It is not until the publication of Paulet's work in 1793 that the genus is securely established. This work, written twenty or more years before its publication, contains descriptions and figures of six species of *Polyporus*; *P. ulmi*, *P. frondosus*, *P. umbilicatus*, *P. carbonarius*, *P. fasciatus* and *P. tuberaster*, four of which belong to Micheli's genus in the strictest sense. The first species, *P. ulmi*, is the very common and well known *P. squamosus* (Huds.), synonymous with *P. caudicinus* (Scop.), and must be considered the nomenclatorial type of *Polyporus* according to principles now in vogue. The general use of *Polyporus* instead of *Boletus* is due to Fries, who, knowing nothing of Paulet's work, "restored" the name in 1815 and popularized it in spite of the influence of Linnæus.

16. *SCUTIGER* Paul. *Icon. Champ.* pl. 31. f. 1-3. 1793.—Based on *S. tuberosus* Paul. and a few other species which are now placed in different genera.

17. *PORIA* Pers. *Neues Mag. Bot.* 1:109. 1794.—Based on *P. medulla-panis* (Jacq.) and two other species now considered generically distinct. See *Poria* of Adanson.

18. *MUCILAGO* Hoffm. *Bot. Taschenb.* pl. 12. f. 2. 1795.—Preoccupied by *Mucilago* Scop. belonging to another family of plants. Synonymous with *Xylophagus* Link.

19. *DAEDALEA* Pers. *Syn. Fung.* 499. 1801.—Founded on *D. quercina* (L.) and four other species. Before listing these species, Persoon quotes Battarra at some length and identifies most of the figures on his pl. 38. No mention is made of

Adanson and his genus *Striglia*, based on the same plate. Synonymous with *Agaricus* L. based on *Agaricus quercinus* L.

20. *FAVOLUS* Palis. Fl. Owar. 1:1. pl. 1. 1805.—Founded on a single species, *F. hirtus* Palis. This plant, which is commonly known as *Hexagonia hirta* Palis., recalls the true honeycomb-like structure of the hymenium which was originally the distinguishing feature of the genus *Favolus*.

21. *MICROPORUS* Palis. Fl. Owar. 1:12. pl. 43. 1805.—Founded on *M. perula* Palis. and three other species, *M. perennis* (L.), *M. fuliginus* (Fr.), and *M. nummularius* (Fr.). *M. perula* is commonly known as *P. xanthopus* Fr.

22. *XYLOPHAGUS* Link, Berl. Mag. 3:38. 1809.—The name was proposed for the section of *Merulius* called *Serpula* by Persoon in his Synopsis, 496, 1801 and is therefore to be considered as based upon *X. lacrymans* (Wulff.) and the four other species there listed. In 1825, Persoon proposed the name *Xylomyzon* for the same group. The name *Merulius* should be used in place of *Cantharellus*, for a genus of the Agaricaceæ, since *Merulius* Hall. (En. Stirp., Helv. 1:33. 1742), based on species now placed in *Cantharellus*, was taken up by Boehmer in Ludwig's Def. Gen. 492, 1760, several years prior to the establishment of the genus *Cantharellus*.

The group of plants comprised in the genus *Xylophagus* do not properly belong with the Polyporaceæ, so I have proposed for them and their allies a new family, the *Xylophagaceæ*, with *Xylophagus* as the type genus (see Torreya, 3:7, 1903).

23. *LEPTOPORA* Rafin. Desv. Journ. Bot. 2:177. 1809.—Founded on *L. nivea* Rafin. and two other species. Probably a synonym of *Poria* Pers. or *Xylophagus* Link, but the identity of the species is in doubt.

24. *PHORIMA* Rafin. Desv. Journ. Bot. 2:177. 1809.—Founded on *P. betulina* Rafin. and two other species. Probably a synonym of *Hexagona* Poll. but the identity of the species is in doubt.

25. *HEXAGONA* Poll. Pl. Nov. 35. pl. 2-3. 1816.—Founded on *H. alveolaris* (DC.), (*Favolus europæus* Fr.). Persoon in Mycol. Eur. 2:35. 1825 cites this genus twice, spelling it *Hexagonia*. At Kew it is still spelled *Hexagona*. Although the form of the word is objectionable it seems best to use it as Pollini first wrote it.

26. *POROTHELIUM* Fr. Obs. 2:272. 1818.—Based on *P. fimbriatum* (Pers.) Fr. and *P. lacerum* Fr. listed in this order. According to Massee, this genus properly belongs with the Hydnaceæ.

27. *SERPULA* S. F. Gray, Brit. Pl. 1:637. 1821.—Founded on *Serpula lacrymans* (Wulf.), the earlier name *Merulius* of Hall being replaced and quoted as a synonym. The name *Serpula* had previously been assigned by Persoon and by Fries to a

section only of *Merulius*. Gray uses *Merulius* for a part of the genus *Cantharellus* and Link had proposed the name *Xylophagus* for the section *Serpula* of Persoon as early as 1809.

28. *GRIFOLA* S. F. Gray, Nat. Arr. Brit. Pl. 1:643. 1821.—Based on *G. frondosa* (Dicks.) and five other species, only one of which is congeneric with the type.

29. *COLTRICA* S. F. Gray, Nat. Arr. Brit. Pl. 1:644. 1821. Based on *C. perennis* (L.) and two other species which belong in a different genus.

30. *ALBATRELLUS* S. F. Gray, Nat. Arr. Brit. Pl. 1:645. 1821.—Founded on *A. ovinus* (Schæff.) and one other species. Gray's citation of Micheli as the author of this and several other generic names used by him is not in accord with modern usage, since Micheli did not use these names for properly constituted genera. Synonymous with *Scutiger* Paul. established in 1793.

31. *STRILIA* S. F. Gray, Nat. Arr. Brit. Pl. 1:645. 1821.—Based on *S. cinnamomea* (Jacq.), a single species, which if not identical with *P. perennis* (L.) Fr. is at least congeneric with it. It is therefore to be regarded as a synonym of *Coltricia* S. F. Gray. The living plant was probably unknown to Gray, otherwise this mistake would hardly have occurred.

32. *CERRENA* S. F. Gray, Nat. Arr. Brit. Pl. 1:649. 1821.—Founded upon *C. unicolor* (Bull.) (*Dædalea unicolor* (Bull.) Fr.), a single species. Synonymous with *Agaricus*.

33. *XYLOMYZON* Pers. Mycol. Eur. 2:26. 1825.—Based on *X. lacrymans* (Wulf.) and fourteen other species. *Merulius* is cited in synonymy. A synonym of *Xylophagus* Link proposed in 1809.

34. *CYCLOMYCES* Fr. Linnæa 5:512. 1830.—Based on *C. fuscus* Fr. sent to Fries by Kunze in Sieber crypt, exs. n. 63. The specimen was already named but the publication belongs to Fries. *Loxophyllum* Kl. Hook. Misc. 2:150. pl. 79, 1831, based on *L. velutinum* Kl. mss., was published only as a synonym of *Cyclomyces* Kze. Klotsch accepted this latter name, which he thought existed only in the mind of Kunze, making his own manuscript name a synonym; at the same time being ignorant of the fact that Fries had published Kunze's name a year before; and apparently not knowing that *Loxophyllum* had been proposed in 1826 for a genus of the *Gesneriaceæ*.

35. *LASCHIA* Fr. Linnæa V: 533. 1830.—At first monotypic, founded on *L. delicata* Fr., which, according to Patouillard, and others, belong to the *Tremellaceæ*.

36. *PHYSISPORUS* Chev. Flor. Par. 1:261. 1836.—Based on *P. obliquus* (Pers.) and eight other species.

37. *CERIOMYCES* Corda in Sturm, Deutsch. Krypt. Fl. 3:133. t. 61. 1837.—Based on the spurious species, *C. fischeri* Corda. No reference is made here to *Ptychogaster*, another spurious genus proposed by Corda about the same time.

38. *CLADOSPORUS* Chev. Fung. 1837. — Based on *C. fulvus* Chev., a single species with branched pilei covered over their whole surface with tubes. The plant appears to resemble abnormal forms of *Polyporus rufescens* Fr., but the original description is not available and Gillet's description in Champ. 1:693, 1878, may be incomplete.

39. *LENZITES* Fr. Epicr. 403. 1838. — Founded on *L. applanata* Fr. and nineteen other species.

40. *TRAMETES* Fr. Epicr. 488. 1838. — Founded on *T. benzoina* (Wahl.) and nineteen other species. In *Novæ Symbolæ*, 94, 1851, Fries said that he had up to that time considered *Trametes* a subgenus of *Polystictus* forms. Then follows a division into tribes, as was his custom with genera, and a listing of species, in which *T. (Scutatae) elegans* (Spr.) stands first. The genus, was, however, properly established in the *Epicrisis*.

41. *PTYCHOGASTER* Corda, Icon. Fung. 2:24. 1838. — Founded on *Pt. albus* Cord., a single species. There is no reference made by the author to his genus *Ceratomyces*, which, like the present genus, is spurious.

42. *LASCHIA* Jungh. Verh. Bat. Genootsch. 1839. — Established on *L. crustacea* Jungh. and one other species, *L. spathulata* Jungh. According to Montagne and Berkeley the two species are not congeneric. Preoccupied by *Laschia* Fr. 1830.

43. *ASCHERSONIA* Endl. Add. 103. 1842. — Proposed for *Laschia* Jungh. because this name was preoccupied by *Laschia* Fr. Its type is therefore *L. crustacea* Jungh. This use of the name *Aschersonia* has precedence over that made of it by Montagne in 1856 for a genus of the *Nectrioideæ*.

44. *JUNGHUHNIA* Corda, Anl. Myc. 195. 1842. — Proposed for *Laschia* Jungh. because *Laschia* Fr. had been published in 1830. Preoccupied by *Aschersonia* Endl. published earlier in the same year and cited as a synonym.

45. *HYMENOGRAMME* Mont. & Berk. Lond. Journ. Bot. 329. 1844. — Based on *H. javensis* Mont. & Berk., a single species, which, according to Saccardo, is congeneric with *Laschia crustacea* Jungh. and *Laschia spathulata* Jungh., the two species upon which *Laschia* Jungh. was founded. If this is true, *Hymenogramme* Mont. & Berk. is only a synonym of *Aschersonia* Endl.

46. *GLOEOPORUS* Mont. Cuba, 234. 1845. — Founded on a single species, *G. conchoides* Mont., a member of the *Xylophagaceæ* (Torreya, 3:7. 1903).

47. *THELEPORA* Fr. Hornsch. Skand. Beitr. 2:338. 1847. — Based on *T. cretacea* Fr., a single species.

48. *ENSLINIA* Fr. Summ. Veg. Scand. 2:399. 1849. — Founded on *Sphæria pocula* Schw. and one other species. Name preoccupied by *Enslinia* Rchb. 1827.

49. *POLYSTICTUS* Fr. Nov. Sym. 70. 1851. — Founded on *P. parvulus* (Kl.) and a number of other species. A synonym of *Coltricia* Gray, proposed in 1821.

50. *FOMES* Gill. Champ. 1:682. 1878.— Founded on *F. unguatus* (Schaeff.) [*F. marginatus* (Fr.)] and sixteen other species. The name was used by Fries in Nov. Sym. 46, 1851, for a section of *Polyporus*. Karsten took up the name for generic use in 1879, a year after its adoption by Gillet.

51. *MERISMA* Gill. Champ. 1:688. 1878.— Based on *M. imberbe* (Bull.) and twelve other species. Name preoccupied for nearly a century, being used by different authors for groups of fungi in which the fruit body was branched. Persoon used it for a group of the *Clavariaceæ*.

52. *POLYPORELLUS* Karst. Medd. Soc. Faun. et Fl. Fenn. 5:37. 1879.— Founded on *P. polyporus* (Retz.) [*P. brumalis* (Fr.)] and several other species. A synonym of *Polyporus*.

53. *ISCHNODERMA* Karst. Medd. Soc. Faun. et Fl. Fenn. 5:38. 1879.— Based on *I. rubiginosum* (Schr.) [*P. resinosus* (Schr.)] and forms intermediate between this species and *I. benzoinum* (Fr.) A synonym of *Trametes* Fr. established in 1838.

54. *BJERKANDERA* Karst. Medd. Soc. Faun. et Fl. Fenn. 5:38. 1879.— Based on *B. adusta* (Willd.) and six other species.

55. *INONOTUS* Karst. Medd. Soc. Faun. et Fl. Fenn. 5:39. 1879.— Founded on *In. cuticularis* (Bull.), *In. hispidus* (Bull.), *In. unicolor* (Schw.) and *In. hypococcinus* (Berk.).

56. *INODERMA* Karst. Medd. Soc. Faun. et Fl. Fenn. 5:39. 1879.— Founded on *In. radiatum* (Sow.) and several other species. Preoccupied by *Inoderma* Gray Nat. Arr. Brit. Pl. 1:498, 1821, a genus of lichens.

57. *ANTRODIA* Karst. Medd. Soc. Faun. et Fl. Fenn. 5:40. 1879.— Based on *Antr. mollis* (Sommerf.) and five other species.

58. *HANSENIA* Karst. Medd. Soc. Faun. et Fl. Fenn. 5:40. 1879.— Established on *H. hirsuta* (Wulf.) together with *H. velutina* (Fr.), *H. zonata* (Fr.), *H. versicolor* (L.), *H. decipiens* (Schw.), *H. barbatula* (Fr.), *H. vellerea* (Berk.), *H. umbonata* (Fr.), *H. zonalis* (Berk.), and other species not found in North America. Name proposed by Turcz., in Bull. Soc. Nat. Mosc. 17:754, 1844, for a genus of the *Umbelliferæ*.

59. *POLYPILUS* Karst. Rev. Myc. 3:17. 1881.— Founded on *P. frondosus* (Dicks.) and two other species, *P. confluens* (A. & S.) and *P. speciosus* (Batarr.) [*P. sulfureus* (Bull.)] A synonym of *Grifola* Gray, 1821.

60. *TYROMYCES* Karst. Rev. Myc. 3:17. 1881.— Established upon *T. chioneus* (Fr.) and *T. pallescens* (Fr.). Difficult to distinguish from *Bjerkandera* Karst. and for the present at least considered synonymous with it.

61. *POSTIA* Karst. Rev. Myc. 3:17. 1881.—Based on *P. borealis* (Fr.) and five other species. Preoccupied by *Postia* Boiss. & Blanche, Boiss. Fl. Orient. 3:182, 1875, a genus of the Compositæ.

62. *GANODERMA* Karst. Rev. Myc. 3:17. 1881.—A monotypic genus founded on *Ganoderma flabelliformis* (Scop.) [*Polyporus lucidus* (Leys.) Fr.] See Torrey Bulletin for October, 1902.

63. *PIPTOPORUS* Karst. Rev. Myc. 3:17. 1881.—Based on *P. suberosus* (L.), a single species.

64. *FOMITOPSIS* Karst. Rev. Myc. 3:18. 1881.—Established upon *F. unguatus* (Batsch.) [*F. pinicola* (Fr.)] and two other species. Synonymous with *Fomes* Gill. established in 1878.

65. *HAPALOPILUS* Karst. Rev. Myc. 3:18. 1881.—Based on a single species, *H. nidulans* (Fr.)

66. *PYCNOPORUS* Karst. Rev. Myc. 3:18. 1881.—Founded on *P. cinnabarinus* (Jacq.), a single species. It had previously been used by Karsten only as a subgenus.

67. *CALOPORUS* Karst. Rev. Myc. 3:18. 1881.—Established upon a single species, *C. incarnatus* (Alb. & Schw.).

68. *GLOEOPHYLLUM* Karst. Hattsv. 2:X, 79. 1879-1881.—Based on *G. hirsutum* (Schaeff.) (*G. saepiarium* (Fr.)). Name changed later by the author to *Lenzitina*.

69. *TYLOTUS* Kalch. Grev. 9:137. June 1881.—Based on *T. lenzitiformis* Kalch., a single species, collected in Africa by J. M. Wood. The character of the genus is its tomentose gills. The author doubted if it were sufficiently distinct from *Lenzites* Fr. Name preoccupied by *Tylotus* J. Ag. Epicr. 428. 1876, a genus of the Florideae. I propose the new name *Tomentifolium* for this genus.

70. *STIGMATOLEMMA* Kalchbr. Grev. 10:104. 1882.—Based on *S. incanum* Kalch., a single species, which, according to Saccardo, is not distinct from species of *Porothelium* Fr.

71. *BRESADOLIA* Speg. Fung. Guar. 1:15. 1883.—Based on *B. paradoxa* Speg., a single species. Spurious.

72. *MYRIADOPORUS* Peck, Bull. Torr. 11:27. 1884.—Founded on *M. adustus* (Willd.) Peck. The author had some misgivings at the time, as is proved by his hesitation in adding another species, *M. induratus* Pk. to the genus just established. Spurious because based on abnormal forms; and also a synonym of *Bjerkandera* Karst. proposed in 1879 for *Polyporus adustus* (Willd.) Fr. and several other species.

73. *CALOPORUS* Quél. Ench. 164. 1886.—Based on *Cal. subsquamosus* (L.) and seven other species. A synonym of *Scutiger* Paul., 1793, and name preoccupied by *Caloporus* Karst. 1881.

74. *LEUCOPORUS* Quél. Ench. 165. 1886.—Founded

upon *L. lepidus* (Fr.) and ten other species. A synonym of *Polyporellus* Karst. established in 1879.

75. *PELLOPORUS* Quél. Ench. 166. 1886. — Founded on *P. triqueter* (Fr.) and six other species. Synonymous with *Inonotus* Karst., established in 1879.

76. *CERIOPORUS* Quél. Ench. 167. 1886. — Founded on *C. caudicinus* (Scop.) [*P. squamosus* (Huds.)] and five other species. A synonym of *Polyporus*.

77. *CLADOMERIS* Quél. Ench. 167. 1886. — Founded on *C. ramosissima* (Scop.) [*Cl. umbellata* (Fr.)] and sixteen other species. Synonymous with *Grifola* of Gray proposed in 1821.

78. *PLACODES* Quél. Ench. 170. 1886. — Founded on *P. flabelliformis* (Scop.) [*F. lucidus* (Leys.) Fr.] and a number of other species, twenty-five or more in all. A synonym of *Ganoderma* Karst. established in 1881.

79. *PHELLINUS* Quél. Ench. 172. 1886. — Based on *P. igniarius* (L.) and three other species. Since this name is preoccupied by *Phelline*, assigned in 1826 to a genus of the Ebenaceae, I proposed the name *Pyropolyporus* for the present genus, referring to the ancient use of *P. igniarius* and closely allied members of the genus for the purpose of keeping fire. See *Torrey Bulletin*, 30:109. 1903.

80. *INODERMUS* Quél. Ench. 173. 1886. — Based on *In. hispidus* (Bull.) and several other species. A synonym of *Inonotus* Karst. established in 1879. The name has later been applied to a genus of Algae. Compare also *Inoderma* Karst. 1879.

81. *CORIOLOUS* Quél. Ench. Fung. 175. 1886. — Founded on *Cor. lutescens* (Pers.) and seven other species.

82. *LEPTOPORUS* Quél. Ench. 175. 1886. — Founded on a long list of species, the first being *L. epileucus* (Fr.). Name preoccupied by *Leptopora* Rafin. 1809. Synonymous with *Bjerkandera* Karst.

83. *MELANOPUS* Pat. Hym. d'Europ. 137. 1887. — Founded on *M. caudicinus* (Scop.) [*P. squamosus* (Huds.)] and several other species. A synonym of *Cerioporus* Quél. established in 1886.

84. *SPONGIPELLIS* Pat. Hym. d'Eur. 140. 1887. — Founded on *S. spumeus* (Sow.) and "some others." Not distinct from *Bjerkandera* Karst.

85. *GYROPHORA* Pat. Hym. Eur. 143. 1887. — Based on "*G. lacrymans*, *G. umbrina*, etc.," species of *Merulius* with colored spores. Name preoccupied for a genus of lichens. Synonymous with *Xylophagus*, a genus of the *Xylophagaceae*.

86. *POROPTYCHE* Beck. Verh. Zool. Bot. Ges. Wien 657. 1888. — Based on *P. candida* Beck, a single species.

87. *OCHROPORUS* Schroet. Fl. Schles. 3:483. 1888. — Based on *O. contiguus* (Pers.) and eighteen other species.

88. PHAEOPORUS Schroet. Fl. Schles. 3:489. 1888. — Based on *P. obliquus* (Pers.) and five other species.

89. DAEDALEOPSIS Schroet. Krypt. Fl. Schles. 3:492. 1888. — A monotypic genus based on *D. labyrinthiformis* (Bull.) [*D. confragosa* (Pers.)]. Type congeneric with the type of *Daedalea*.

90. MUCRONOPORUS Ell. & Ev. Journ. Myc. 5:28. March 1889. Based on *M. circinatus* (Fr.) and eleven other species.

91. PHYSISPORINUS Karst. Krit. Ofvers. af Fin. Basidsv. 324. 1889. — Based on *Ph. vitreus* (Pers.), a single species.

92. ONNIA Karst. Finlands Basidsv. 326. 1889. — Founded on *O. circinata* (Fr.) and one other species, *O. tomentosa* (Fr.). The distinguishing feature of the genus is the presence of slender, pointed brown cystidia. Synonymous with *Mucronoporus* Ell. & Ev. established earlier in the same year.

93. ELFVINGIA Karst. Krit. Ofversigt af Fin. Basidsv. 333. 1889. — A monotypic genus based on *E. lipsiensis* (Batsch) [*Fomes applanatus* (Pers.)]. See Torrey Bulletin for May 1903.

94. LENZITINA Karst. Finlands Basidsv. 337. 1889. — Based on *L. hirsuta* (Schaeff.) [*L. saepiaria* (Fr.)] and two other species. Synonymous with *Gloeophyllum* Karst. Hattsv. 2:X, 79. 1879-1881. For some reason, probably on account of its inappropriateness, the latter name was changed to *Lenzitina* in 1889.

95. OLIGOPORUS Bref. Unters. 8:114-118. pl. 7. f. 12-22. 1889. — Founded on *O. farinosus* Bref. and two other newly described species. *O. farinosus* properly belongs to the genus *Tyromyces* Karst. 1881.

96. HETEROBASIDION Bref. Unters. 8:154. 1889. — Based on a single species, *H. annosum* (Fr.), which is described at great length. Preoccupied by *Heterobasidium* Mass., 1888. Synonymous with *Fomes*.

97. CAMPBELLIA Cke. & Mass. Grev. 18:87. 1889. — Founded on *C. infundibuliformis* Cke. & Mass. and *C. africana* Cke. & Mass. Preoccupied by *Campbellia* Wight, a genus of phanerogams and therefore replaced by *Rodwaya* H. & P. Sydow, Hedw. 40:(2). 1901.

98. TRECHISPORA Karst. Hedw. 29:147. 1890. — Founded on *T. onusta* Karst., a single species.

99. CHAETOPORUS Karst. Hedw. 29:148. 1890. — Based on *C. tenuis* Karst., a single species. According to some authorities this species is synonymous with *B. resupinatus* Bolton, pl. 165, 1791, and *P. spongiosus* Pers.

100. SCLERODEPSIS Cke. Grev. 19:49. 1890. — Founded on *S. colliculosa* (Berk.) and three other species, *S. berkeleyi* (Cke.), *S. lobata* (Berk.) and *S. beyrichii* (Fr.), all taken from the genus *Trametes*. In this genus the pileus is thin and flat

with acute margin and the edges of the pores are acute and sometimes dentate.

101. *LACCOCEPHALUM* MacAlpine & Tepper. A New Australian Stone-making fungus 166. pl. 10. 1890(?). — Founded on *L. basilapidoides* MacAlp. & Tepp., a single species.

102. *MYCODENDRON* Mass. Jour. Bot. 1. pl. 300, f. 14-16. 1891. — Based on *M. paradoxum* Mass., a single species.

103. *PODOPORIA* Karst. Hedw. 31:297. 1892. — Founded on a single species, *P. confluens* Karst. The resupinate pileus is attached only at the center.

104. *SCENIDIUM* Kuntze. Revis. Gen. 515. 1893. — Founded on *Sc. hirtum* (Beauv.) Kze., a species of *Favolus*. Kuntze gets the name from Klotsch who used it for a subgenus in *Linnaea*, 7:200. pl. 10. 1832.

105. *SARCOPORIA* Karst. Hedw. 33:15. 1894. — Based on *S. polyspora* Karst., a single species closely allied to the *Xylophagaceae*.

106. *FAVOLASCHIA* Pat. Bull. Boiss. 54. 1895. — Founded on *F. saccharina* Pat., a single species. This genus belongs with the *Xylophagaceae*.

107. *HENNINGSIA* Möll. Protobasid. 44. 1895. — Based on *H. geminella* Möll., a single species.

108. *XANTHOCHROUS* Pat. Cat. Tun. 51-52. 1897. — Based on *X. tomentosus* (Fr.) and a number of other species from various recognized genera, which are thrown together chiefly because of similarity in spore coloration. A synonym of *Mucronoporus* Ell. & Ev. based on *M. circinatus* (Fr.) Ell. & Ev., a congener of *X. tomentosus* (Fr.).

109. *GYROPHANA* Pat. Cat. Tun. 53. 1897. — Substituted for *Gyrophora* Pat. Hym. Eur. 143, 1887, because the latter name was found to be preoccupied. Synonymous with *Xylophagus* Link.

110. *POROLASCHIA* Pat. Bull. Soc. Myc. 55. 1898. — Based on *P. micropora* Pat., a single species. Whether the above citation is correct for the establishment of the genus it is impossible for me now to determine, but the species, the only one known, is described there as new and I know of no other reference to the genus.

111. *RODWAYA* H. & P. Syd. Hedw. 40:(2). 1901. — This name was substituted for *Campbellia* Cke. & Mass., which was preoccupied by *Campbellia* Wight, a genus of the *Scrophulariaceae*. The original species are cited and transferred, i. e. *R. infundibuliformis* (Cke. et Mass.) Syd. and *R. africana* (Cke. et Mass.) Syd., in the original order.

112. *CRYPTOPORUS* Shear. Bull. Torr. 29:450. Jul. 1902. — A monotypic genus based on *Cryptoporus volvatus* (Peck).

ALPHABETICAL SUMMARY.

Names free to be used are in capitals; synonyms in lower case; the species with which the generic name is to be permanently associated follows the date.

- AGARICUS L. 1753. — *A. quercinus* L.
 Agaricon Adans. 1763. — *A. igniarium* (L.). Name preoccupied. See *Pyropolyporus*.
 Albatrellus S. F. Gray. 1821. — *A. ovinus* (Schaeff.). See *Scutiger*.
 ANTRODIA Karst. 1879. — *A. mollis* (Sommerf.).
 ASCHERSONIA Endl. 1842. — *A. crustacea* (Jungb.).
 BJERKANDERA Karst. 1879. — *B. adusta* (Willd.).
 Bresadolia Speg. 1883. — *B. paradoxa* Speg. Genus spurious.
 CALOPORUS Karst. 1881. — *C. incarnata* (Alb. & Schw.).
 Caloporus Qué. 1886. — *C. subsquamosus* (L.). Name preoccupied by *Caloporus* Karst. See *Scutiger*.
 Campbellia Cke & Mass. 1889. — *C. infundibuliformis* Cke. & Mass. See *Rodwaya*.
 Cellularia Bull. 1788. — Type indeterminate.
 Ceratophora Humb. 1793. — *C. annulatus* (Schaeff.). Spurious, established on abnormal forms.
 Ceriomyces Batarr. 1755. — *C. crassus* Batarr. (*Boletaceae*).
 Ceriomyces Corda. 1837. — *C. fischeri* Corda. A spurious genus with a preoccupied name.
 Cerioporus Qué. 1886. — *C. caudicinus* (Scop.). See *Polyporus*.
 Cerrena S. F. Gray. 1821. — *C. unicolor* (Bull.). See *Agaricus*.
 CHAETOPORUS Karst. 1890. — *C. tenuis* Karst.
 Cladomeris Qué. 1886. — *C. ramosissima* (Scop.). See *Grifola*.
 Cladosporus Chev. 1837. — *C. fulvus* Chev. Probably spurious.
 COLTRICIA S. F. Gray. 1821. — *C. perennis* (L.).
 CORIOLUS Qué. 1886. — *C. lutescens* (Pers.).
 CRYPTOPORUS Shear. 1902. — *C. volvatus* (Peck).
 CYCLOMYCES Fr. 1830. — *C. fuscus* Fr.
 Daedalea Pers. 1801. — *D. quercina* (L.). See *Agaricus*.
 Daedaleopsis Schroet. 1888. — *D. labyrinthiformis* (Bull.). See *Agaricus*.
 ELFVINGIA Karst. 1889. — *E. lipsiensis* (Batsch).
 Enslinia Fr. 1849. — *E. pocula* (Schw.). Name preoccupied.

Favolaschia Pat. 1895. — *F. saccharina* Pat. (Xylophagaceae.)

FAVOLUS Palis. 1805. — *F. hirtus* Palis.

FOMES Gill. 1878. — *F. unguatus* (Schaeff.) Sacc.

Fomitopsis Karst. 1881. — *F. unguatus* (Schaeff.). See *Fomes*.

GANODERMA Karst. 1881. — *G. flabelliforme* (Scop.).

GLOEOPHYLLUM Karst. 1881. — *G. hirsutum* (Schaeff.).

Gloeoporus Mont. 1845. — *G. conchcoides* Mont. (Xylophagaceae.)

GRIFOLA S. F. Gray. 1821. — *G. frondosa* (Dicks.).

Gyrophana Pat. 1897. — See *Gyrophora*. See *Xylophagus*.

Gyrophora Pat. 1887. — *G. lacrymans* (Wulf.). Name preoccupied. See *Xylophagus*.

Hansenia Karst. 1879. — *H. hirsuta* (Wulf.). Name preoccupied. See *Coriolus*.

HAPALOPILUS Karst. 1881. — *H. nidulans* (Fr.).

Heterobasidion Bref. 1889. — *H. annosum* (Fr.). Name preoccupied. See *Fomes*.

HEXAGONA Pall. 1816. — *H. alveolaris* (DC.).

Hymenogramme Mont. & Berk. 1844. — *H. javensis* Mont. & Berk. Name preoccupied. See *Aschersonia*.

Inoderma Karst. 1879. — *In. radiatum* (Sow.). Name preoccupied.

Inodermus Quél. 1886. — *In. hispidus* (Bull.). Name preoccupied. See *Inonotus*.

INONOTUS Karst. 1879. — *In. cuticularis* (Bull.).

Ischnoderma Karst. 1879. — *I. rubiginosum* (Schrad.). See *Trametes*.

Junghuhnia Corda. 1842. — *J. crustacea* (Jungh.). Name preoccupied. See *Aschersonia*.

Kordera Adans. 1763. — Not based on a binomial species.

LACCOCEPHALUM MacAlp. & Tepp. 1890(?). — *L. basilapidoides* MacAlp. & Tepp.

Laschia Fr. 1830. — *L. delicata* Fr. (Tremellaceae.)

Laschia Jungh. 1839. — *L. crustacea* Jungh. Name preoccupied. See *Aschersonia*.

LENZITES Fr. 1838. — *L. applanata* Fr.

Lenzitina Karst. 1889. — *L. hirsutum* (Schaeff.). See *Gloeophyllum*.

Leptopora Rafn. 1809. — Species indeterminate.

Leptoporus Quél. 1886. — *L. epileucus* (Fr.). Name preoccupied. See *Bjerkandera*.

Leucoporus Quél. 1886. — *L. lepideus* (Fr.). See *Polyporellus*.

Melanopus Pat. 1887. — *M. caudicinus* (Scop.). See *Cerioporus*.

Merisma Gill. 1878. — *M. imberbe* (Bull.). Name preoccupied. See *Bjerkandera*.

Merulius (Hall.) Boehm. 1760. — (Agaricaceae, as the name is used by Saccardo.)

MICROPORUS Palis. 1805. — *M. perula* Palis.

Mison Adanson. 1763. Not based on a binomial species. See *Pyropolyporus*.

Mucilago Hoffm. 1795. — Preoccupied by *Mucilago* Scop. See *Xylophagus*.

MUCRONOPORUS Ell. & Ev. 1889. — *M. circinatus* (Fr.).

MYCODENDRON Mass. 1891. — *M. paradoxum* Mass.

Myriadoporus Peck. 1884. — *M. adustus* (Willd.). See *Bjerkandera*. Based on abnormal forms.

OCHROPORUS Schroet. 1888. — *O. contiguus* (Pers.).

Oligoporus Bref. 1889. — *O. farinosus* Bref. See *Tyromyces*.

Onnia Karst. 1889. — *O. circinata* (Fr.). See *Mucronoporus*.

Pelloporus Quél. 1886. — *P. triqueter* (Fr.). See *Inonotus*.

Phaeoporus Schroet. 1888. — *P. obliquus* (Pers.). See *Physisporus*.

Phellinus Quél. 1886. — *P. igniarius* (L.). Name preoccupied. *Pyropolyporus* proposed. See *Torrey Bulletin* for Feb. 1903.

Phorima Rafin. 1809. — Species indeterminate.

PHYSISPORINUS Karst. 1889. — *Ph. vitreus* (Pers.).

PHYSISPORUS Chev. 1836. — *P. obliquus* (Pers.).

PIPTOPORUS Karst. 1881. — *P. suberosus* (L.).

Placodes Quél. 1886. — *P. flabelliformis* (Scop.). See *Ganoderma*.

PODOPORIA Karst. 1892. — *P. confluens* Karst.

Polypilus Karst. 1881. — *P. frondosus* (Dicks.). See *Grifola*.

Polyporellus Karst. 1879. — *P. polyporus* (Retz.). See *Polyporus*.

Polyporus (Mich.) Adans. 1763. — Not founded on a binomial.

POLYPORUS (Mich.) Paulet. 1793. — *P. caudicinus* (Scop.).

Polystictus Fr. 1851. — *P. parvulus* (Kl.). See *Coltricia*.

Poria Adans. 1763. — Not founded on a binomial.

PORIA Pers. 1794. — *P. medullapanis* (Jacq.).

Porolaschia Pat. 1898. — *P. micropora* Pat. (Xylophagaceae.)

POROPTYCHE Beck. 1888. — *P. candida* Beck.

Porothelium Fr. 1818. — *P. fimbriatum* (Fers.). (Hydnaceae?).

Postia Karst. 1881. — *P. borealis* (Fr.). Name preoccupied. See *Bjerkandera*.

Ptychogaster Corda, 1838. — *Pt. albus* Corda. Spurious.

PYCNOPORUS Karst. 1881. — *P. cinnabarinus* (Jacq.)

Pyreium Paul. 1793. — *P. giganteum* Paul. Not in the Polyporaceae.

PYROPOLYPORUS Murrill. 1903. — *P. igniarius* (L.).

RODWAYA H. & P. Sydow. 1901. — *R. infundibuliformis* (Cke. & Mass.).

SARCOPORIA Karst. 1894. — *S. polyspora* Karst. Allied to *Xylophagus*.

Scenidium Kze. 1893. — *S. hirtum* (Palis.) Kze. See *Favolus*.

SCLERODEPSIS Cke. 1890. — *S. colliculosa* (Berk.).

SCUTIGER Paul. 1793. — *S. tuberosus* Paul.

Serda Adans. 1763. — Not based on a binomial. See *Gloeophyllum*.

Serpula Gray. 1821. — *S. lacrymans* (Wulf.). See *Xylophagus*.

Sesia Adans. 1763. — Not based on a binomial. See *Gloeophyllum*.

Spongipellis Pat. 1887. — *S. spumeus* (Sow.). See *Bjerkandera*.

Stigmatolemma Kalch. 1882. — *S. lincanum* Kalch. See *Porothelium*.

Striglia Adans. 1763. — Not based on a binomial. See *Agaricus*.

Strilia Gray. 1821. — *S. cinnamomea* (Jacq.). See *Coltricia*.

THELEPORA Fr. 1847. — *T. cretacea* Fr.

Tilotus Kalch. 1881. — *T. lenzitiformis* Kalch. Name preoccupied. See *Tomentifolium*.

TOMENTIFOLIUM nom. nov. — *T. lenzitiforme* (Kalch.).

TRAMETES Fr. 1838. — *T. benzoina* (Wahl.).

TRECHISPORA Karst. 1890. — *T. onusta* Karst.

Tyromyces Karst. 1881. — *T. chioneus* (Fr.). See *Bjerkandera*.

Xanthochrous Pat. 1897. — *X. tomentosus* (Fr.). See *Mucronoporus*.

Xylometron Paul. 1793. — Type indeterminate.

Xylomyzon Pers. 1825. — X. lacrymans (Wulf.). See Xylophagus.

Xylophagus Link. 1809. — X. lacrymans (Wulf.). Proposed in Torreyia 3:7, 1903, as the type of a new family, the Xylophagaceae.

New York City.

THE GENUS SARCOSOMA IN NORTH AMERICA.

ELIAS J. DURAND.

The genus *Sarcosoma* includes several large gelatinous *Bulgaria*-like Discomycetes. It was proposed by Caspary, in a letter to Winter, for the *Bulgaria globosa* Fries, and a new variety, var. *platydiscus* Caspary. The description first appeared in Rehm's Discomycetes, page 497, 1891. In this place Dr. Rehm doubtfully referred to it the *Bulgaria rufa* Schw., and this species has remained the only known representative from North America. In August, 1901, I collected, at Blowing Rock, North Carolina, two *Bulgaria*-like fungi which are referable to this genus, and I have thought it desirable to bring together at this time complete descriptions of such forms as are at present known to occur in our flora. All of the following descriptions were made by me after a careful examination of the living plants, and the changes made by drying have also been noted.

SARCOSOMA Caspary, in Rabenh. Krypt. Flora, 1³:497. 1891. *Burcardia* Schmidel, Anal. Plant. 3:261. 1797. (not Schreb. 1789). *Bulgaria* Fries, Syst. Myc. 2:166. 1822, in part.

A genus of the Bulgariaceæ. Plants not erumpent, sessile or stipitate, usually brown or blackish, at least externally, spongy-gelatinous. Asci long cylindrical. Spores 8, uniseriate, hyaline, continuous, elliptical. Paraphyses filiform, septate, branched.

Differs from *Bulgaria* principally in the superficial habit, and in the hyaline spores. Plants of large size growing on half buried sticks and branches.

A. Disk tawny-ochraceous

B. Plants stipitate, watery-gelatinous, shrinking much in drying; spores narrowly elliptical, 18-25 x 8-12 μ cortex parenchymatous.

S. rufum.

B. Plants sessile, tough-gelatinous, shrinking but little in drying; spores broadly elliptical, 25-30 x 15 μ , cortex not parenchymatous.

S. carolinianum.

A. Disk black, cinereous-olive when dry.

S. cyttarioides.

SARCOSOMA RUFUM (Schw.) Rehm, Rabenh. Krypt. Flora 1³: 497. 1891. *Bulgaria rufa* Schw., Syn. Fung. Am. Bor. p. 178.

1834. Exsicc. Ellis, N. A. F. no. 449; Ravenel, Fung. Car. fasc. no. 23.

Plants solitary or crowded on the branch, stipitate; when young very small, ovate-cylindrical, closed, the apex warty, soon opening exposing the very small disk, the whole plant then increasing greatly in size until maturity when the disk is saucer-shaped or plane, 3-6 cm. in diam., tawny-ochraceous, margin thin, crenate; stem turbinate, 2-3 cm. long, 2 cm. thick above, narrowed below to a small point of attachment, the whole exterior covered with a thin, appressed, blackish-brown tomentum, more or less wrinkled or rugose; consistency watery-gelatinous. When dry much shrunken, horny and brittle, externally deeply wrinkled, and the disk usually changed to a dull grayish-black excipulum of very slender hyphæ passing at the surface into a thin cortex of rounded brown cells $10\ \mu$ diam. Asci narrowly cylindrical, apex truncate-rounded, not blue with iodine, $300-350 \times 12\ \mu$; spores 8, uniseriate, hyaline, or with a pale yellowish tint, smooth, continuous, eguttulate, narrowly elliptical, $18-25 \times 8-12\ \mu$ (the majority $20 \times 10\ \mu$); paraphyses filiform, hyaline, septate, branched, apices very little thickened, not cohering.

On fallen, half-buried branches usually of oak, among leaves, June to August, common. Maine (Harvey); Mass. (Sprague); N. York (various col.); Penn. (various col.); N. Carolina (Curtis); Ohio (Morgan, James). The species will probably be found in all the States east of the Mississippi.

In the type, in herb. Schweinitz, the spores are narrowly elliptical, $20-25 \times 8-10\ \mu$.

SARCOSOMA CAROLINIANUM Durand sp. nov.—Plants solitary, sessile, attached by a dark brown tomentum; at first closed, then opening by a pore at the apex, expanding and enlarging finally becoming saucer-shaped, up to 4 cm. diam. Disk tawny-ochraceous, externally brown, covered with a thick, appressed, brown tomentum, threads very long $7-8\ \mu$ thick, septate, rather shining, but little wrinkled; substance tough-gelatinous, not at all watery, so that the plant nearly retains its shape, size and color when dry. Consistency of the dry plant *corky*, not horny and brittle, and exterior nearly even. Flesh white, excipulum composed entirely of interwoven hyphæ which are thick and septate, $5-6\ \mu$ diam. Asci clavate-cylindrical, narrowed below to a long, slender pedicel, apex rounded, not blue with iodine, $400-450 \times 18\ \mu$, opening by a lid. Spores 8, uniseriate, hyaline, smooth, continuous, elliptical, $25-30 \times 15\ \mu$ (the majority $28 \times 15\ \mu$); Paraphyses cylindrical, hyaline, septate, very little thickened at the free tips, $3\ \mu$ thick.

Attached to dead sticks, among leaves, on damp wooded slopes, alt. 3,500 ft., Blowing Rock, N. Carolina, Aug. and Sept., 1899, G. F. Atkinson (C. U. Herb. no. 4363); 1901, E. J. Durand (C. U. Herb. no. 12279).

This species is related to the last, but the characters may be contrasted as follows:

S. rufum.—Watery-gelatinous, turbinate or stipitate, attached by a narrow point, shrinking much in drying, becoming brittle and thin, the exterior much wrinkled, color usually changing, spores narrowly elliptical. Cortex parenchymatous.

S. carolinianum.—Tough-gelatinous, sessile by a broad base, changing but little in drying, becoming thick and corky, spores larger and broader proportionally. No parenchymatous cortex.

That the tougher substance of the present species when fresh is not due to dry weather conditions is shown by the fact that my own collection was made after two weeks of continuous rain and mist.

SARCOSOMA CYTTARIOIDES Rehm sp. nov.—Plants usually solitary but often 2-3 together, sessile, attached by a very narrow base; when young very small, closed, then opening by a minute pore above, enlarging and expanding, finally becoming plane or convex, the mature plant shaped like a biconvex lens, but somewhat more prominently convex below; disk dull black, usually with a dimple in the center; margin slight but distinct; externally black, more or less wrinkled or rugose, furfuraceous not tomentose, 1.5-3.5 cm. in diam., 1-2 cm. high; consistency spongy-gelatinous like soft rubber, substance greenish-yellow. Excipulum composed of very slender, long-drawn-out hyphæ, passing at the surface into a thin cortex of brown rounded cells, 8-10 μ in diam., projecting in groups. Asci slenderly cylindrical, apex rounded, not blue with iodine, 300-350 x 15 μ ; spores 8, uniseriate, hyaline continuous, smooth, narrowly elliptical, 25-30 x 12-14 μ ; paraphyses filiform, branched, yellow, cohering at the tips which are not yellow.

On dead stems of *Kalmia*, less commonly on oak, vitis and chestnut; also on leaves of chestnut, rhododendron etc.; observed also on living stems of *Kalmia* and chestnut near the ground. Thickets on the mountain side, alt. 3,500 ft., Blowing Rock, N. Carolina, Aug., 1901, Durand; found also by A. B. Troyer. (C. U. Herb. nos. 12278, 12279, 12280, 12281, 12282). Most abundant in Glen Burney.

The plants shrink very much in drying, and the disk becomes cinereous-olive. A beautifully distinct species. "Innerlich dem *S. platydiscus* und *rufum* nahe stehend."

NOTE: *Bulgaria globosa* Fr. is reported by Schweinitz, p. 178, but the specimen preserved in his herbarium is certainly not that species as described by Rehm and Karsten, and probably does not differ from *Sarcosoma rufum*.

Botanical Department, Cornell University.

TWO NEW SPECIES OF *CERCOSPORA*.

J. B. ELLIS AND W. A. KELLERMAN.

CERCOSPORA *ÆSCULINA* Ell. & Kellerm. n. sp. On leaves of *Aesculus octandra*. Marlinton, W. Va., Aug. 1902. (W. A. Kellerman.) Fig. 1.

Hypophyllous, scattered over the lower face of the leaf and forming small sphaeriform tufts resembling somewhat the perithecia of *Sphaerella*, but not on any spots though the upper surface of the leaf is marked with minute, snow-white, punctiform

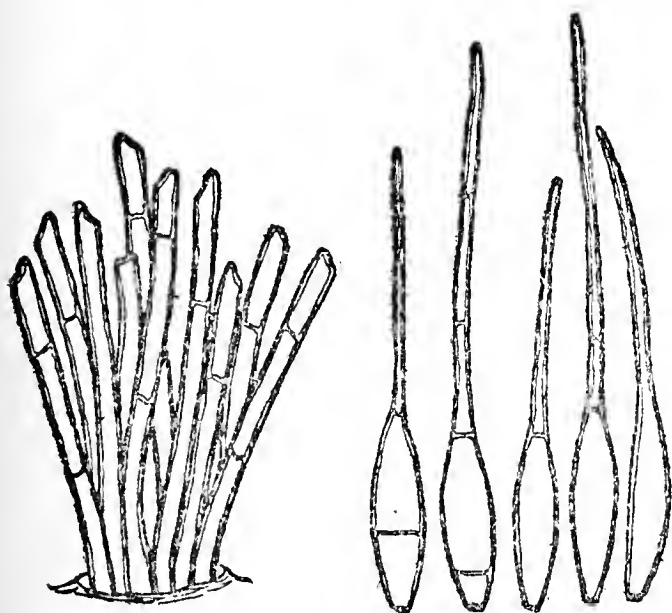


Fig. 1. Conidiophores and conidia of *Cercospora æsculina* Ell. & Kellerm.

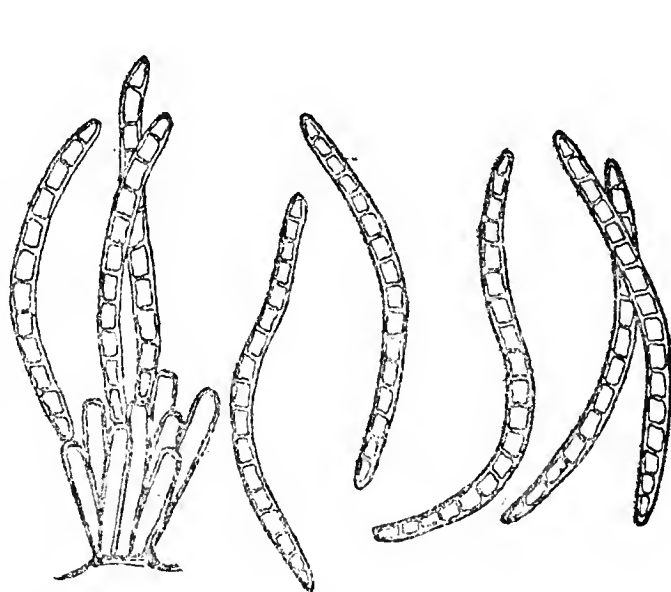


Fig. 2. Conidiophores and conidia of *Cercospora guttulata* Ell. & Kellerm.

spots. Hyphæ cespitose, pale-brown, nearly straight, 2-3-septate, slightly toothed above, bearing conidia $60-70 \times 5-6 \mu$, abruptly contracted above and often distinctly constricted at one of the septa.

CERCOSPORA *GUTTULATA* Ell. & Kellerm. n. sp. On leaves of *Aristolochia macrophylla*. Marlinton, W. Va., Aug. 1902. (W. A. Kellerman.) Fig. 2.

Spots amphigenous, suborbicular, dirty gray with a narrow, nearly black border, $\frac{1}{2}$ -1 cm. diam. Hyphæ short ($15-20 \times 3-4 \mu$), amphigenous, but more abundant below, densely tufted, the tufts thickly scattered on the spots, cylindrical, straight or subundulate, simple, obtuse at the apex, nearly hyaline. Conidia cylindrical or slightly narrowed above, moderately curved, multiguttulate, becoming multiseptate, $45-80 \times 4-5 \mu$, nearly hyaline.

Differs from *C. serpentaria* E. & E. and *C. olivacea* Sacc. in its much shorter hyphæ, and from the latter also in its curved conidia.

ANOTHER MUCH-NAMED FUNGUS.

W. A. KELLERMAN.

In the February number of this Journal was published by Ellis and Kellerman, the description of a fungus supposed to be new to the literature of Botany. The figure which accompanied the description served well to convey to the botanists at home and abroad a clear and accurate idea of the characters of the organism in question.

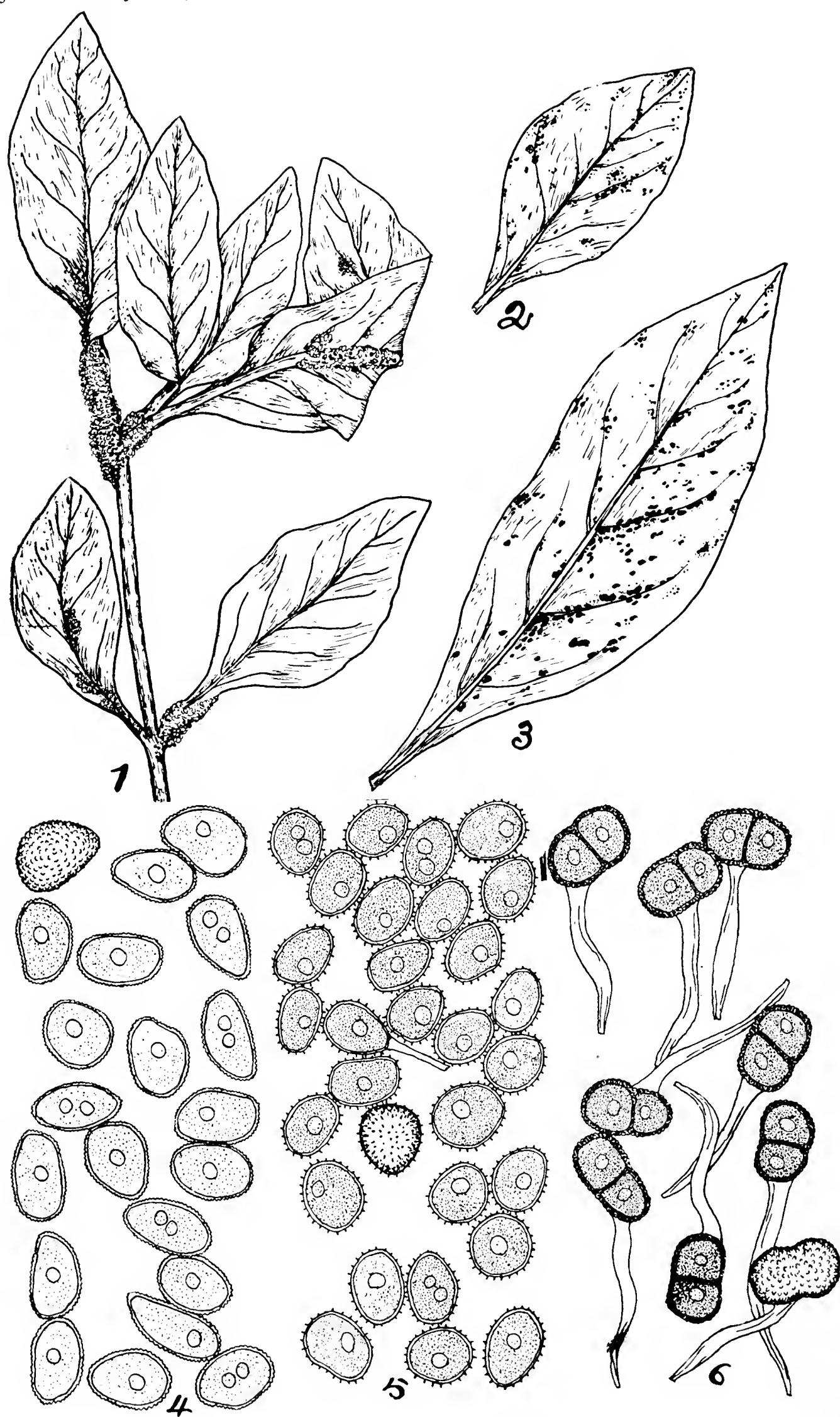
Professor Morgan and other eminent mycologists very kindly notified me promptly that it was a species described many years ago — though we had thought that the variation from Corda's species was unmistakable and as great as in case of many other plants proposed as new by botanists of more or less repute.

We are now quite willing to recede from our position and apologize for the unfortunate mistake made. It may not, however, be impertinent to remark that the case is perhaps not without its value in furnishing a convincing demonstration of the value, may I not say necessity, of invariably publishing figures of all the fungi (especially of the microscopic forms) proposed as new.

The synonymy which I give below shows that more than once before, when this form was issued as previously undescribed, the error was not readily or at all detected by most of the botanists, whereas figures might have arrested the attention of all the mycologists.

Two of the published names should perhaps first be specially mentioned, one by Pound and Clements and the other by R. Maire. Dr. Frederic E. Clements advised me that our species was published by him in The Univ. of Nebr. Bot. Stud. III, under the name of *Botrytis* (*Polyactis*) *doryphora* Pound & Clements, afterwards changed to *Phymatotrichum doryphora* Pound & Clements. I submitted a specimen to the latter for inspection, and he kindly returned the favor by sending a specimen of his species. We were both able to confirm the accuracy of his first judgment.

Herr Prof. Dr. Magnus of Berlin kindly wrote me a letter with full description and drawings, made from material I sent, which can not be reproduced in full here, but the following extracts will illustrate his judgment in regard to the same: "Wie Sie schon in Ihrem werthen Schreiben vermuthen, ist es ein *Botryosporium*. . . . Was die Art anbetrifft, so scheint sie mir am meisten mit *Botryosporium pulchellum* R. Maire übereinzustimmen. Wie bei dieser Art sind die Hauptfäden der Conidien-träger einfach, 'ramulis acropetis, simplicibus, *apice inflatis*, 4-6-tuberculatis, tuberculis capita triloba gerentibus.' Alles dieses stimmt genau, und Saccardo hebt noch



Puccinia lateripes B. & Rav.

als charakteristisch für die Art die: Hyphae primaria simplex und den habitus cupressiformi hervor." I will venture to include Maire's name in the list of synonyms, since if our species is that described by this author, it must also be a synonym of Corda's species.

I may also add that Mons. le Prof. C. A. J. A. Oudemans, of Brussels, took our species for a republication of his, but in a subsequent letter notified me that he regarded ours (and his) as Corda's species, a judgment approved, so he stated, by the eminent mycologist Mons. P. A. Saccardo.

I am indebted to Professor Morgan and others for most of the items in the following which is perhaps the complete synonymy to the present time:

1. *Botryosporium pulchrum* Corda, *Prachtflora*, 1839.
2. *Botryosporium elegans* Corda, *Anleitung*. 1842.
3. *Cephalosporium elegans* Bonorden, *Handb.* 1851.
4. *Phymatotrichum pyramidale* Bonorden, *Handb.* 1851.
5. *Botryosporium pyramidale* Costantin, *Mus.* 1888.
6. *Botrytis longibrachiata* Oudemans, *Microm.* 1890.
7. *Botrytis* (*Polyactis*) *doryphora* Pound & Clements, *Bot. Surv. Nebr. III. Rep.* 1893. 1894. [*Phymatotrichum doryphora* Pound & Clements in herb.]
8. *Botryosporium pulchellum* R. Maire, *Bull. Soc. Sci. Nancy*, 1900.
9. *Cephalosporium dendroides* Ell. & Kellerm., *Jour. Mycol.* 1903.

PUCCINIA LATERIPES B. & RAV. AN AUT-EU-PUCCINIA.

W. A. KELLERMAN.

It has been assumed hitherto that the pycnidial and æcidial stages as well as the uredo and teleutospores, occurring on *Ruellia strepens*, were the polymorphic forms of one and the same species of *Puccinia*. Cultures were instituted to determine the correctness of this view.

In late winter at an opportune time roots of *Ruellia strepens* were removed to the greenhouse. Old stems and leaves infected with the Rust were at the same time afforded like opportunity to absorb heat which presumably would render the spores viable when wanted for inoculations. The experiments were carried on as related below.

After the plants had resumed their vegetative activity and shoots a few inches long had developed (March 5th), some soil together with the partially decayed leaves adjacent to the stems, exposed in the natural habitat all winter, was placed around and

in contact with them to induce natural infection (Expt. No. 79). It was presumed that the spores adjacent to the growing shoots might germinate and infect the host. Such proved to be the case. *Spermogonia* appeared at the base of the shoots in two of the pots March 23. A week later the characteristic *æcidia* appeared.

Artificial infection in the usual way was also practiced. The teleutospores exposed all winter on stems of *Ruellia strepens* were sown on plants in the greenhouse March 25 (Expt. No. 81). *Spermogonia* appeared April 2, and *æcidia* followed in abundance April 10. These were mainly on the upper leaves on which the sowings were made.

Æcidiospores obtained in Experiments 79 and 81 were used to inoculate plants of *Ruellia strepens* reserved for this purpose. This experiment (No. 138) was successful, in the usual time the uredospores and teleutospores appearing in great abundance. No plants besides those used in the above experiments, though adjacent, exhibited any of the stages of the Rust. From all of the foregoing it is experimentally demonstrated that this species is an *Aut-eu-puccinia*.

With the assistance of Mr. J. G. Sanders and Miss Clara G. Mark I am able to illustrate this species; see Plate II. A few notes are also added.

The pycnidia and *æcidia* on the stems cause usually a slight distortion, the tissues of the affected part of the host becoming slightly hypertrophied. Fig. 1 shows such a case; this was sketched from an artificially infected plant. The distortion in consequence of slight hypertrophy in leaves is much less except when the midrib is attacked—in which case the curvature may be greater than that of the stems. The affected areas of the leaves are usually more restricted; the spots are very irregular, mostly angular, usually 3-6 mm. in diameter, the border a greenish yellow. Those of the stem, petiole and midrib are mostly longer (6-15 mm.). The sori are a dirty red-brown color.

The *æcidiospores* are quite irregular in shape as shown in figure 4. They have thick walls, verrucose on the surface, and are reddish or yellowish-brown in color. A number of our recorded measurements are as follows: 33x15, 26x20, 25x18, 30x19, 24x18, 31x18, 25x20, 35x15, 36x13, 30x22, 30x20 μ .

The sori of the uredo and teleuto stages on the leaves are mostly circular or slightly irregular, $\frac{1}{2}$ -1 mm. diameter. They fuse in many cases to considerable extended areas. The sori on the stems are much larger.

The uredospores are brown, echinulate, slightly smaller than the *æcidiospores*, as these measurements show: 21x18, 21x16, 24x18, 24x16, 30x17, 25x15, 18x18, 25x18, 20x16, 24x17 μ . Numerous spores are shown in fig. 5.

The teleutospores are very dark brown (the sori appear black), thick-walled, verrucose, the pedicels 50-65 μ long and 5-8 μ wide. Some spores are shown in fig. 6. Recorded measurements mostly from material obtained by cultures are: 28x21, 26x15, 30x17, 30x18, 29x19, 27x18, 27x21, 28x18, 30x21, 27x18, 27x20, 27x19 μ .

Explanation of Plate II. *Puccinia lateripes* B. & Rav. Figs. 1-3 natural size; figs. 4-6 magnified 350 diameters. Fig. 1. Portion of stem from culture plant showing sori of pycnidia and æcidia on stem and leaves. Fig. 2. Leaf with uredo and some teleuto sori, obtained by cultures. Fig. 3. Leaf with teleuto sori collected preceding year. Fig. 4. Æcidiospores obtained by cultures. Fig. 5. Uredospores obtained by cultures. Fig. 6. Teleutospores.

THE ALTERNATE FORM OF *AECIDIUM HIBISCIATUM*.

W. A. KELLERMAN.

An enormous quantity of the *Æcidium* on *Hibiscus moscheutos* occurring on the margins of Buckeye Lake, a reservoir eight or nine miles long, located forty miles east of Columbus, afforded good opportunity to study its teleutosporic connection. Several Rusts were likewise very abundant in the immediate vicinity of the clumps of this host. It seemed at first necessary to regard the *Puccinia* on *Carex scoparia* as the alternate of the *Æcidium* but that is doubtless connected with a stage on *Erigeron*. Then *Uromyces burrillii* was considered in the case though abundant in a very few places on the Reservoir margins. Cultures instituted gave only negative results, and this clue was necessarily abandoned. Next it was concluded that since *Puccinia polygoni-amphibii* was present and immediately adjacent to most of the clumps of the *Hibiscus*, it might be the missing link, but unsuccessful cultures effectually demonstrated the erroneous supposition.

Success with cultures was attained at last when the next probability was more seriously laid hold of, namely, that *Puccinia muhlenbergiæ* Arthur might be the teleutosporic stage in question. Host plants had been early placed in the green house, March 20, and tardily resumed active growth furnishing excellent host plants for the operations. Likewise the Rust was placed in the same congenial temperature and the pre-season experiments could then be carried on with assurance of success if the suspected connection was not improperly guessed.

Sowings were made April 24 (Exp. No. 146) on *Hibiscus moscheutos* using the teleutospores of *Puccinia muhlenbergiæ*

Arth. from *Muhlenbergia mexicana*. On May 5 a few spermogonia appeared and a few days later the numerous clusters became very conspicuous. *Æcidia* in fair numbers appeared May 15. This experiment seemed from the first appearance of the spermogonia to be conclusive, yet it was deemed best to repeat it on a larger scale. Accordingly three thrifty large plants and two transplanted somewhat later and only pushing out the shoots half an inch, the leaves not yet unfolded, were carefully inoculated (Exp. No. 161) with teleutosporic material similar to that used in the first experiment. On May 13 the spermogonia appeared and at this writing all of the leaves of the five plants inoculated are highly colored with the myriads of spermogonia and *æcidia*, and a few of them are partially aborted from the presence of the parasite.

Cæoma Æcidium hibisci was described by Schweinitz in 1834 (Trans. Am. Phil. Soc. Philadelphia, 4:239). The *Puccinia* in question, rather common throughout Eastern United States, was called *Puccinia windsoriæ* and *Puccinia dochmia*. Dr. Arthur has shown that these two names apply to different species of Rusts—the former designating a *Puccinia* that belongs to *Tricuspis* (*Triodia*), and the latter having as its host the species of *Muhlenbergia*. But he separated the Rust in question from *Puccinia dochmia* and proposed the name *Puccinia muhlenbergiæ* Arth., Bull. Lab. Nat. Hist. State Univ. Iowa, 5:317. Oct. 1902.

It therefore becomes necessary to make a new combination as shown in the following paragraph which also recapitulates the synonymy:

PUCCINIA HIBISCIATUM (Schw.) Kellerman n. n.

Æcidium hibisci Schw. 1834.

Puccinia windsoriæ Burr. non Schw. 1885.

Puccinia muhlenbergiæ Arth. 1902.

OHIO FUNGI. FASCICLE VII

W. A. KELLERMAN, OHIO STATE UNIVERSITY.

List of Species and Hosts.

121. *Aecidium grossulariæ* (Pers.) Schm., on *Ribes cynosbati* L.
122. *Albugo candidus* (Pers.) Kuntze., on *Bursa bursa-pastoris* (L.) Britt.
123. *Cercospora maianthemii* Fckl., on *Unifolium canadense* (Desf.) Greene.
124. *Cladosporium herbarum* (Pers.) Link., on *Ampelopsis tricuspidata* Sieb. & Zucc.
125. *Corticium oakesii* B. & C., on *Ostrya virginiana* (Mill.) Willd.
126. *Hydnum coralloides* Scop., on Beech logs.

127. *Hydnum erinaceus* Bull., on rotten logs.
128. *Puccinia cirsii-lanceolati* Schroet., on *Carduus lanceolatus* L.
129. *Puccinia helianthi* Schw., on *Helianthus decapetalus* L.
130. *Puccinia lateripes* B. & R., teleutospores, on *Ruellia strepens* L.
131. *Puccinia lateripes* B. & R., æcidiospores, on *Ruellia strepens* L.
132. *Puccinia violæ* (Schum.) DC., on *Viola striata* Ait.
133. *Ramularia barbareæ* Pk., on *Barbareæ barbareæ* (L) McM.
134. *Ramularia variabilis* Fckl., on *Verbascum thapsus* L.
135. *Ramularia arvensis* Sacc., on *Potentilla monspeliensis* L.
136. *Septoria erigeronis* Pk., on *Erigeron annuus* (L.) Pers.
136. *Septoria lycopersici* Speg., on *Lycopersicon lycopersicon* (L.) Karst.
138. *Septoria scrophulariæ* Pk., on *Scrophularia marylandica* L.
139. *Stereum sericeum* (Schw.) Fr., on *Carpinus caroliniana* Walt.
140. *Uromyces trifolii* (Hedw.) Lev., on *Trifolium pratense* L.

121. *Aecidium grossulariæ* (Pers.) Schum.

Spermogonia only.

On *Ribes cynosbati* L.

Columbus, Ohio.

May 9, 1902.

Coll. W. A. Kellerman.

Supplement to No. 81.

122. *Albugo candidus* (Pers.) Kuntze.

On *Bursa bursa-pastoris* (L.) Britt.

Columbus, Ohio.

May 9, 1903.

Coll. W. A. Kellerman.

Supplement to No. 63.

123. *Cercospora maianthemii* Fckl.

On *Unifolium canadense* (Desf.) Greene.

(*Maianthemum canadense* Desf.)

West Mansfield, Logan Co., O.

June 10, 1902.

Coll. W. A. Kellerman.

"*C. Majanthemi*. — F. rh. 1631. — Cæspitibus in marculis exaridis, punctformibus, gregariis, cinereo-viridibus; hyphis erectis, continuis, simplicibus, flexuosis, crassis, multiguttulatis, fuscis; conidiis linearibus, multiseptatis fuscescentibus, sæpe curvatis.

"An der unteren Fläche noch lebender Blätter von *Majanthemum bifolium*, selten, im Sommer. Im Jura von Morthier gesammelt." L. Fuckel, *Symbolæ Mycologicæ*, 353. 1869.

124. Cladosporium herbarum (Pers.) Link.

On old stems of *Ampelopsis tricuspidata* Sieb. & Zucc.

Columbus, Ohio.

March 20, 1903.

Coll. W. A. Kellerman.

"*DEMATIUM HERBARUM*: Effusum compactum virescente-olivaceum pulverulentum.

"In caulibus plantarum maiorum, colore læte olivaceo distinguitur.

"*Byssus cæspitosa*." D. C. H. Persoon, *Synopsis Methodica Fungorum*, 699. 1801.

122. Corticium oakesii B. & C.

On *Ostrya virginiana* (Mill.) Willd.

Columbus, Ohio.

Sept. 8, 1902.

Coll. F. J. Tyler.

"*PEZIZA AMORPHA*: Sparsa subcoriacea majuscula sessilis, cupulis orbicularibus subeffusisque: disco planiusculo rufo, externe tomentoso-albidis.

"*Peculiarem hanc speciem Thelephoris subaffinem mihi misit Dom. Ludwig*. Lin. 1-2 lata. *Cupulae* nonnullae longitudinaliter in unc. unam confluunt." D. C. Persoon, *Synopsis Methodica Fungorum*, 657. 1801.

126. Hydnum coralloides Scop.

On Beech logs.

Westerville, Franklin Co., O.

Oct. 22, 1902.

Coll. J. G. Sanders.

"*Clavaria ramosa*; extremis ramulis teretibus, subulatis, recta deorsum descendentibus."

"*Habitat in udis putridisque lignis. Octobri M.*"

"*Stipes cum trunco, cui innascitur angulum reductum constituit, ultimi vero ramuli cum eodem trunco paralleli sunt Erinaceorum aculeis simillimi, and forte eusdem Gentis.*" J. A. Scopoli, *Flora Carniolica*, 61. 1760.

127. Hydnum erinaceus Bull.

On rotten logs.

Columbus, Ohio.

Oct. 15, 1902.

Coll. Modesto Quiroga.

"*Hydne Hérisson. Hydnum erinaceus.*

Hydnum majus, convexum è candido-flavicans nec coriaceum; aculeis longissimis, gradatim dependentibus.

"*In quercubus vivis parasitat; ut plurimum sessile; interdum in formam stipitis lateralis plus minus elongati, fig. A, gracilescens.*

Agaricus barbatus flavescens. Buxb. Cent. I. 35. Tab. 56. Fig. 1.

Caract. Spécif. L'Hydne Hérisson est une des plus grandes espèces de ce genre; il est convexe, blanc d'abord, jaunâtre ensuite; sa base charnue et tendre est hérissée de longs aiguillons qui pendent tous parallèlement et se terminent par étages." Pierre Bulliard, *Histoire des Champignons de la France*, 1:304. Pl. 34. 1791.

128. *Puccinia cirsii=lanceolati* Schroet.On *Carduus lanceolatus* L.

Lakeside, Ottawa Co., O.

Sept. 21, 1902.

Coll. W. A. Kellerman.

"*P. Cirsii lanceolati* n. sp. Aecidien in kleinen Gruppen zusammengestellt. Pseudoperidien sehr locker gefügt, weit becherförmig. Sporen elliptisch mit farbloser, feinwarziger Membran und hell orange-rothem Inhalt. Uredo in rundlichen, kastanienbraunen Häufchen. Sporen kugelig, elliptisch oder eiförmig, $24-30\mu$ lang, $20-25\mu$ breit; Membran kastanienbraun, feinstachlig, an den Seiten mit 3, bei Befeuchten stark aufquellenden Keimporen. Teleutosporen in den Uredo-Häufchen auftretend, oder alleinstehend in schwarzbraunen Häufchen, elliptisch, nach unten abgerundet oder etwas verschmälert, in der Mitte wenig oder gar nicht eingeschnürt, $33-42\mu$ lang, $22-26\mu$ breit; Membran dunkel kastanienbraun, glatt, am Scheitel etwas verdickt und oft in eine flache kappenförmige Spitze verschmälert." J. Schroeter, Kryptogamen-Flora von Schlesien, Pilze, 3¹:317. 1889.

129. *Puccinia helianthi* Schw.On *Helianthus decapetalus* L.

Buckeye Lake, Licking Co., Ohio.

Oct. 23, 1902.

Coll. W. A. Kellerman.

Supplement to No. 10.

130. *Puccinia lateripes* B. & R.On *Ruellia strepens* L.

Columbus, Ohio.

September 1902.

Coll. W. A. Kellerman.

"*Puccinia lateripes*. B. & R.

"*Epiphylla* maculis flavis vel nullis; sporis brevibus utrinque obtusis pedicello longo flexuoso laterali.

"On leaves of *Ruellia*. Car. Inf. Ravenel. No. 1641.

"Spots yellow or quite obsolete; sori scattered; spores short, obtuse at either end, almost horizontal, with a long lateral flexuous stem." M. J. Berkeley, *Grevillea*, 3:52. December 1874.

131. *Puccinia lateripes* B. & R.

Æcidia only.

On *Ruellia strepens* L.

Columbus, Ohio.

June 22, 1902.

Coll. W. A. Kellerman.

Supplement to No. 130.

132. *Puccinia violae* (Schum.) DC.*Æcidium.*On *Viola striata* Ait.

Columbus, Ohio.

May 5, 1903.

Coll. J. G. Sanders.

"Ae. *Violæ*, orbiculare vel oblongum vel solitarie sparsum flavum, peridiis cupularibus flavis, ore dentato erecto pulvere aurantiaco.

"Congestum in foliis, solitarie et sparsum in petiolis *Violæ caninæ*. Eestate." Schumacher, *Enumeratio plantarum in partibus Sællandiae*, 2:224. 1803.

133. *Ramularia barbareae* Pk.On *Barbarea barbarea* (L.) McM.

Columbus, Ohio.

May 8, 1903.

Coll. W. A. Kellerman.

"*Ramularia barbareae* n. sp.

"Spots suborbicular, arid, white, generally bordered by a slightly thickened brown line; flocci amphigenous, either short and branched or long and simple; spores oblong or cylindrical, often catenulate, rarely uniseptate, .0004 to .0009 inch long, .00012 to .00016 broad." Charles H. Peck, *Annual Report of the New York State Museum of Natural History*, 1886, 40:63. 1887.

134. *Ramularia variabilis* Fckl.On *Verbascum thapsus* L.

Columbus, Ohio,

May 2, 1903.

Coll. W. A. Kellerman.

"*R. variabilis*.—F. rh. 135. pr. p. (unter *Oidium Fusisporioides*).—Cæspitibus laxis, tenuibus, candidis, in macula subfusca virescentive; hyphis fasciculatis, flexuosis, brevissimis; conidiis valde variis, ovatis, obovatis, ellipticis cylindraceisve, hyalinis."

"An den Blättern von *Verbascum Thapsus* und *Digitatis purpurea*, häufig, im Herbst." L. Fuckel, *Symbolæ Mycologicæ*, 361. 1869.

135. *Ramularia arvensis* Sacc.On *Potentilla monspeliensis* L.

Columbus, Ohio.

May 8, 1903.

Coll. W. A. Kellerman.

"*Ramularia arvensis* Sacc. F. it t. 1000—Maculis subcircularibus albicantibus, rubro-marginatis, minutis; hyphis epiphyllis fasciculatus subsimplicibus, continuis, hyalinis, denticulatis; conidiis cylindraceis, continuis v. 1—septatis, 22-26 x 2.5-4, breve catenulatis, hyalinis." P. A. Saccardo, *Michelia*, 2:548. 1882.

136. Septoria erigerontis Pk.On *Erigeron annuus* (L.) Pers.

Columbus, Ohio.

May 19, 1903.

Coll. W. A. Kellerman.

"Septoria Erigeronis n. sp.

"Spots small, orbicular, distinct, rarely confluent, arid, surrounded by a dark brown or blackish line; perithecia minute, black on the upper surface of the leaf; spores thread-shaped, simple, 1/1000' long or more.

"Leaves of *Erigeron annuum*. Greenbush. July. The spots are 1"-2" in diameter." Charles H. Peck, Annual Report of the New York State Cabinet of Natural History, 1871, 24:87. 1873.

137. Septoria lycopersici Speg.On *Lycopersicon lycopersicon* (L.) Karst.

Columbus, Ohio.

Aug. 2, 1903.

Coll. W. A. Kellerman.

"SEPTORIA LYCOPERSICI Speg. (n. sp.)

Diag. Maculae magnae saepe totum folium occupantes, sordide fusco-cinerascentes, subindeterminatae; perithecia sparsa saepius hypophylla, lenticulari-hemisphaerica, prominula, atra, membranacea, contextu parenchymatico, olivaceo; spermatia bacillari-cylindracea v. bacillari-subclavulata majuscula (70-110 x 3), 3-pluriseptata, utrinque obtusiuscule attenuato-rotundata, hyalina.

Hab....In foliis languidis *Solani lycopersici* in hortis, Boca del Riachuelo, Maj. 1881." Auctore Carolo Spegazzini, Fungi Argentini, Pugillus quartus, 115. 1882.

138. Septoria scrophulariae Pk.On *Scrophularia marylandica* L.

Columbus, Ohio.

May 9, 1903.

Coll. W. A. Kellerman.

"Septoria Scrophulariae n. sp.

"Spots small, arid, whitish, surrounded by a purplish-brown border; perithecia few, on the upper surface; spores filiform, curved, hyaline, .001'-.0016' long." Charles H. Peck, Annual Report of the New York State Museum of Natural History, 1889, 40:57.

139. Stereum sericeum (Schw.) Fr.On *Carpinus caroliniana* Walt.

Columbus, Ohio.

Oct. 17, 1902.

Coll. W. A. Kellerman.

"Thelephora sericea Sz.

"T. minor sessilis orbiculata repanda papyracea confluens sericea candida, hymenio pallide fuscescente substriato, papillis minutis.

"Frequens ad ramulos emortuos juniores. Orbiculata, centro affixa. Pileus sericeus, nitens, strigositate arcte appressa." L. D. de Schweinitz, Synopsis Fungorum Carolinae Superioris, 80. 1822. [Excerpt, Schrift. d. Nat. Gesellschaft zu Leipzig.] z

140. Uromyces trifolii (Hedw.) Lev.

Uromyces trifolii (Hedw.) Lev.

On Trifolium pratense L.

Columbus, Ohio.

Nov. 4, 1902.

Coll. W. A. Kellerman and Jas. McOwen, Jr.

"Puccinie des trefles. Puccinia trifolii.

"Puccinia trifolii. Hedw. f. Fung. ined. t. 18.

"Cette espèce est intermédiaire entre les puccinies et les uredos; elle attaque les tiges, les pétioles, les nervures et les deux surfaces des feuilles; elle boursoufle, défigure, recroqueville souvent les organes sur lesquels elle croît et empêche le trèfle de fleurir; ses taches sont oblongues ou irrégulières, bordées ou couvertes par les débris de l'épiderme déchiré; la poussière est d'un brun roux, composée de globules ovoïdes portés sur un pédicelle excessivement court, et qui est quelquefois obliqué. J'ai trouvé cette espèce dans un pré ombragé, près Fontenai-aux-Roses: elle croît sur le trèfle filiforme et le trèfle hybride." DeCandolle, Flore Française, 2:225. 1815.

*Correction, May 28, 1903.***82. Puccinia hibisciatum (Schw.) Kellerm.**

Æcidium hibisciatum Schw.

*Correction, May 28, 1903.***108. Puccinia hibisciatum (Schw.) Kellerm.**

Puccinia muhlenbergiae Arth.

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ACACIA emarginata, host to Pyropolyporus robiniae Murrill n. sp.
Bull. Torr. Bot. Club, 30:115. Feb. 1903.

ACACIA farnesiana, pods, host to Ravenelia siliquae Long n. sp.
Bot. Gaz. 35:118. Feb. 1903.

ACAROSPORA epilutescens A. Zahlbr. n. sp., ad saxa granitica.
Beihefte z. Bot. Centralbl. 13:161. 1902.

ACAROSPORA obpallens (Nyl.) A. Zahlbr. n.n. [Lecanora obpallens Nyl.] Beihefte z. Bot. Centralbl. 13:161. 1902.

ACAROSPORA peltastica A. Zahlbr. n. sp., ad saxa granitica. Beihefte z. Bot. Centralbl. 13:161. 1902.

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- SOIL, damp, under stones, matrix for *Phleboscypus radicans* Clements n. sp. Bull. Torr. Bot. Club, 30:94. Feb. 1903.
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- SPHAERELLA *colorata* Peck, *syn. of Mycosphaerella colorata*, q. v.
- SPHAERELLA *gossypina* Atkinson, *syn. of Mycosphaerella gossypina*, q. v.
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- WOODS, habitat for *Flammula velata* Peck n. sp. Bull. Torr. Bot. Club, 30:95. Feb. 1903.
- WOODS, moist, habitat for *Marasmius subpilosus* Peck n. sp. Bull. Torr. Bot. Club, 30:95. Feb. 1903.
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NOTES FROM MYCOLOGICAL LITERATURE. V.

W. A. KELLERMAN.

NEW SPECIES OF FUNGI BY CHARLES H. PECK, Bulletin of the Torrey Botanical Club (30:95-101, Feb. 1903), includes 17 species of the higher Fungi belonging to as many genera. A new Genus, namely *Mitruliopsis*, is proposed. The *Morchella* described (*M. punctipes*) is said to be closely allied to *M. semilibera* but has larger spores and a squamulose stem.

FASCICULUS II of VOLUMEN I, MONOGRAPHIA UREDINEARUM, P. et H. Sydow, dated 15 Nov. 1902, is the second installment of the genus *Puccinia*, pp. 193-384, species numbers 303-595, ending with the hosts of family Umbelliferae. There are eleven full-page plates of outline spore-figures all drawn to the same amplification. Where several Rusts occur on species of the same genus a conspectus specierum is always given. A large number of new species and new names are proposed; of the former six, of the latter three pertain to North American Rusts.

A GOOD MONOGRAPH OF THE RAVENELIAS OF THE UNITED STATES AND MEXICO, by William H. Long, Jr., is published in the Botanical Gazette, 35:111-133, pl. II and III, Feb. 1903. Keys are given to the three genera, and to the species of *Ravenelia* (19) and of *Pleoravenelia* (6). Two new genera are proposed, namely, *Pleoravenelia* and *Neoravenelia*, the former having six species, the latter one. All the species are fully described, full synonymy given, hosts and localities enumerated. The species are figured on two double-page plates. The preface gives the distribution of the known species, the methods in preparing the spores for examination (boiling in lactic acid), refers to previous work on the group, and makes acknowledgments for assistance.

A DESTRUCTIVE APPLE ROT FOLLOWING SCAB is detailed by H. J. Eustace in N. Y. Agr. Exp. Sta. Bull. 227:367-389, Pl. I-VIII, Dec. 1902. The fungus, which is the cause of the Rot, is *Cephalothecium roseum* Cda., generally regarded as a saphro-

phyte merely and of no economic importance. The author states that it is a wound parasite and can not go through sound epidermis; hence its association with Scab.

IN THE TRANSACTIONS OF THE MASSACHUSETTS HORTICULTURAL SOCIETY for the year 1902 (pp. 64-73) is printed an interesting lecture by M. B. Waite, delivered Feb. 15, 1902, on the Fungous Diseases of Fruits. After a brief general discussion of the significance of diseases, he outlines the principal facts of a few of the most important orchard diseases.

H. & P. SYDOW GIVE IN ANNALES MYCOLOGICI No. 2, a list of about a dozen and a half fungi, proposed as new in the last two years, bearing names that have been previously used — therefore replaced by new names. Of these only one (*Cercospora sessilis* Ell. & Ev. Jour. Mycol. 8:71, June 1902) appeared in an American periodical. *Didymostilbe* P. Henn. antedates *Didymostilbe* Bres. et Sacc. (the same fungus) 26 days. Another case of a similar generic name applied to the same species is Allescher's *Microdiplodia* (1901) and F. Tassi's *Microdiplodia* (1902).

A KEY TO THE NORTH AMERICAN SPECIES OF LENTINUS — I, by F. S. Earle, is given in *Torreyia*, 3:35-8, March 1903. The following sections are recognized in the key: *Pleuroti*, *Resupinati*, and *Mesopodes* including *Criniti*, *Lepidei*, *Pulverulenti*, *Cochleati*, and *Cornucopioides*.

ON A CANKER OF THE OAK, (*Quercus rubra*), Professor M. C. Potter, University of Durham Philosophical Society, Proceedings, vol. II, part 2, 1902, gives an account of a *Stereum* for which the name of *Stereum quercinum* is proposed.

THE BROWN ROT DISEASE OF THE REDWOOD, by Hermann von Schrenk, forms a part of U. S. Dept. Agr. Bureau of Forestry, Bulletin 38 (pp. 29-31, pl. X & XI), but at present no one fungus can be determined to be the cause of this disease. It is surmised that the cause may be the same as that of the Pine Rot of *Libocedrus decurrens*, namely, *Polyporus libocedris*.

UROMYCES OCCIDENTALIS DIETEL N. SP., on *Lupinus latifolius*, *L. argenteus*, and *L. sileri*, is published in *Beiblatt zur Hedwigia*, 42:(98), and other species are critically considered in the same article — the title being *Ueber die Uromyces-Arten auf Lupinen*, von P. Dietel.

ANNALES MYCOLOGICI, Vol. I. No. I, Jan. 1903 (pp. 1-96; pl. I-II), H. Sydow, contains the following articles: *Vorwort*; *Ueber die auf Leguminosen lebenden Rostpilze und die Verwandtschaftsverhältnisse der Gattungen der Pucciniaceen* (P. Dietel); *Diagnosen neuer Uredineen und Ustilagineen nebst Bemerkungen zu einigen bereits bekannten Arten* (H. & P. Sydow); *Notae mycologicae* (P. A. Saccardo); *Ueber eine neue Pilzkrankheit*

auf der Eberesche (*Sorbus aucuparia*) (A. von Jaczewski); Ueber das Vorkommen von *Neocosmospora vasinfecta* Erw. Smith auf *Sesamum orientale* (A. von Jaczewski); Ueber die auf *Anemone narcissiflora* auftretenden Puccinien (H. & P. Sydow); *Asteroconium saccardoi* Syd. nov. gen. et spec. (H. & P. Sydow); Der Mucor der Hanfrötte, *M. hiemalis* nov. spec. (C. Wehmer); *Riccoa aetnensis* Cav. Nouveau genre de Champignons du Mont Etna (F. Cavara); Une Mucorinée purement conidienne, *Cunninghamella africana* (L. Matruchot); Un nouveau genre de Chytridiacées; le *Rhabdium acutum* (P. A. Dangeard); and *Fungi polonici* (J. Bresadola).

AN ENUMERATION OF "FUNGI AUSTRALIENSIS," VON P. HENNINGS, with descriptions of several new species, occupies 16 pp. in the März Heft of *Beiblatt zur Hedwigia* (1903); the same containing also the following new genera: *Dielsiella* (*Hysteriaceæ*); *Pritzeiella* (*Hyalostilbaceæ*).

NEW OR PECULIAR NORTH AMERICAN HYPHOMYCETES, III, BY ROLAND THAXTER (*Botanical Gazette*, 35:153-9, pl. IV-V, March 1903), is an admirable account of two new genera, *Heterocephalum* with one species, and *Cephalophora* with two species. These coprophilous species were obtained from Jamaica, Porto Rico, and other tropical countries, and have been studied under cultivation for ten years. No ascigerous form was produced. The excellent figures of these striking forms suggest and illustrate the advantage, if not necessity, of figuring everything proposed as new. If cuts could be published invariably in the botanical journals, it would be a wise thing to bring nothing to light unless properly illustrated; and may the time speedily come when a congress of botanists can properly and effectually enact and enforce such a law.

SOME TALUS CLADONIA FORMATIONS ARE INTERESTINGLY AND INSTRUCTIVELY discussed by Bruce Fink in the *Botanical Gazette*, 35:195-208, March 1903. It is based on work done in 1897 on the north shore of Lake Superior, supplemented by study in the same region in 1902. These rare but interesting Lichen Societies are designated as the *Cladonia gracilis* formation of shaded talus, and the *Cladonia rangiferina* formations of shaded talus. Five full-page half tones are used for illustrations.

JOHN L. SHELDON GIVES A VERY INTERESTING ACCOUNT of his Cultures of *Empusa*, in the *Journal of Applied Microscopy and Laboratory Methods* (6:2012-20, March 1903), illustrated by two plates. The work was carried on in connection with the experiments with the South African Locust Fungus, Mr. Sheldon preparing the cultures of the latter to be sent out into different parts of Nebraska, in 1902. Though that fungus did not seem to be the cause of the death of grasshoppers, an *Empusa* (*E. grylli*)

was found which was the destructive agent. Cultures were made in bouillon-agar, better success attained when hyphal bodies were used rather than conidia, but it was a very difficult matter to obtain pure cultures. The demonstration that *Empusa* can be grown artificially is important, yet Mr. Sheldon is not very sanguine as to its great economic importance. He says that "while little may be expected from an economic standpoint, there is something to be gained from a study of its cultural characters both morphologically and taxonomically."

A POPULAR ACCOUNT OF ANTHRACNOSE (*Colletotrichum lagenarium* (Pass.) Ell. & Hals.), Downy Mildew (*Plasmopara cubensis* (B. & C.) Humph.), Timber Rot (*Sclerotinia libertiana* Fckl.), Damping Off (*Pythium debaryanum* Hesse), and Powdery Mildew (*Erysiphe polygoni* DC.) — the most common diseases in Massachusetts occurring on Cucumbers—is published by George E. Stone in the Agr. Exp. Sta. Bulletin No. 87, pp. 34-40, Feb. 1903.

WILLIAM ALPHONSO MURRILL CONTRIBUTES HIS SECOND PAPER ON THE POLYPORACEÆ (the genus *Pyropolyporus*) to the Bulletin of the Torrey Botanical Club, 30:109-120, Feb. 1903. The name of *Phellinus* by Quélet, who first separated the European species into a distinct generic group, is regarded as untenable (preoccupied by *Phelline* in fam. Ebenaceæ) and hence *Pyropolyporus* is proposed. A synopsis (key) is given of the 18 N. A. species; also full notes and range-stations. Ten species are described as new.

NOVA ASCOMYCETUM GENERA SPECIESQUE, auctore F. E. Clements, quattuor genera et triginta quattuor species in Bulletin of the Torrey Botanical Club, 30:83-94, Feb. 1903, descripta sunt. Explicatio et adnotationes Latine expressæ sunt. Quædam rationes quæ ab eodem auctore propositæ erant in "Greek and Latin Nomenclature" (University Studies, Nebraska 3:1-86) Dec. 1902, hic adhibitæ sunt. Botanica nomina, quia scilicet non pura Latina verba vel quia hybrida sint, reicit; quam autem rationem non omnes botanici approbabunt. *Neottiopezis* pro *Neottiella* Cook, nomine hybrido, substituta est. *Phleboscypus* pro *Paxine* nomine hybrido, præpositum est.

THE SECRETARY'S REPORT, BY W. F. GANONG, of the Washington meeting of the Society for Plant Morphology and Physiology contains abstracts of the following four mycological articles: Notes on the Genus *Herpomyces* (Thaxter); On the 'Blue' Color of Coniferous Timber (von Schrenk); *P. stewarti* the Cause of Sweet Corn Disease of Long Island (Erw. F. Smith); and a Bacterial Disease, the cause of which enters the plant through Stomates (Erw. F. Smith).

THE PAPERS IN *ANNALES MYCOLOGICI* No. 2 are as follows — Bresadola, Ab. J.; *Fungi polonici a cl. Viro B. Eichler lecti*; Ward, H. Marshall: Further Observations on the Brown Rust of the Bromes, *Puccinia dispersa* (Erikss.) and its adaptive parasitism; Buchholtz, Fedor: Zur Morphologie und Systematik der *Fungi hypogaei*; Sydow, H. u. P.: Die Mikrosporen von *Anthoceros dichhotomus* Raddi, *Tilletia abscondita* Syd. nov. spec.; Sydow, H. u. P.: Nomenklatorische Bemerkungen zu einigen kurzlich neu beschriebenen Pilzarten; Cavara, Fr.; A. N. Berlese, Necrologue.

THE MYCOLOGICAL ARTICLES in *Hedwigia*, Heft 1, Bd. 42, 15 Feb. 1903, are as follows: Ueber gelungene kulturversuche des Hausschwammes (*Merulius lacrymans*) aus seinen Sporen, von Dr. Alfred Möller; Einige neue und interessante deutsche Pezizeen II, von P. Hennings; Die Arten der Gattung *Disciseda* Czern, von L. Hallós; *Ruhlandiella berolinensis* P. Henn. n. gen. et n. sp., eine neue deutsche Rhizinaceae; Bemerkungen ueber einige Puccien, von Fr. Bubák; and *Septoria spergulariae* Bres. n. sp., von R. Staritz.

NO MORE INTERESTING LITTLE ARTICLE could be written than *Where Lichens Grow*, by the late Thomas A. Williams, reprinted from the *Asa Gray Bulletin* in the December number of the *Plant World* (5:241-3. Dec. 1902.) In answer to "Say, Mister, what are you getting off them rocks?" and "They ain't alive, are they?" Professor Williams made explanations that stimulated the interest of the boys who abandoned fishing and became enthusiasts in the collection and study of lichens. The article is concluded along entertaining and instructive lines suggested by the title, — among other things the fact is mentioned that Lichens may have peculiar habits, as old iron, clothes, bones, and the like. "The skull of a buffalo was found literally covered with species of *Placodium*, *Lecidea*, and *Physcia*, a single jaw-tooth bearing as many as five distinct species."

G. BRIOSI AND R. FARNETI DESCRIBE A NEW SPECIES, namely, *Ovularia citri*, in *fructibus Citronum*, *Atti dell Inst. Bot. dell Univ. di Pavia*, N. S. vol. VIII.

NEARLY A DOZEN FORMS ARE FULLY DESCRIBED AND FIGURED under the title of *Notes on Certain Cladonias*, by Bruce Fink and Mabel A. Husband, *Bryologist*, 6:21-7, March 1903.

CHARLES J. CHAMBERLAIN, SECRETARY OF SECTION G, BOTANY, A. A. A. S., gives the abstracts of papers presented before that body at the Washington Meeting, *Science*, N. S. 17:257-265, 13 Feb. 1903. The mycological papers were by C. L. Shear, F. L. Stevens, Wm. B. Alwood, E. J. Durand, W. A. Orton and A. D. Selby.

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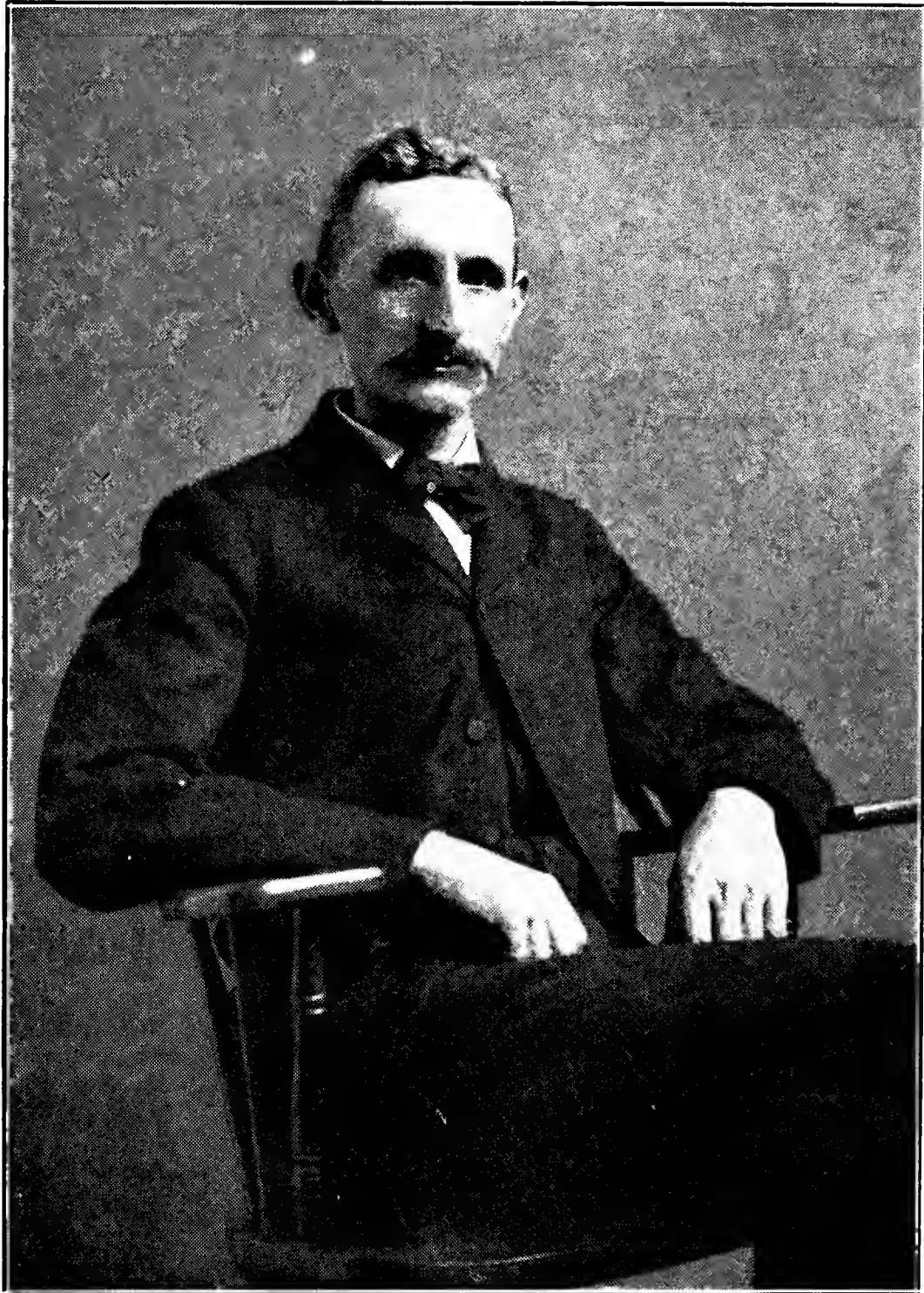
NOTES.

IT IS not quite clear why mycological papers should be presented before three or four or more American botanical societies — or rather to go to the real root of the matter, why there should be the numerous organizations as there are, unrestricted or national in scope and indistinguishable in objects and methods.

WOULD it not be most rational, and from every point of view far preferable to have for presentation and discussion of the *scientific papers* but one national association — though of course the more local clubs throughout the country the better perhaps. This general organization might well be Section G, A. A. A. S. At each annual meeting as many divisions could be made as necessary and convenient for the more satisfactory reading and consideration of the papers grouped according to subjects.

WHY should not the various botanical societies (other than local organizations) *exist for* and be *devoted exclusively* to their definite restricted subjects — meeting *not* for hearing papers on general scientific subjects or even the details of research work, *but* for the purpose of discussing, improving, extending methods, terminology, publication, indexing, etc. For example, the general purpose of promoting research and publishing the results to which we may perhaps say the Botanical Society of America *is* in the main committed, is a most worthy object; why is that not sufficiently ambitious? Why should the papers dealing with all manner and scope of research work be *read* before it? Ditto, for the other botanical societies too numerous to mention. Section G, A. A. A. S. would furnish an audience patient and long suffering.

AND now the Mycologists (Systematists) are talking of organizing; having a society of their *own*! Certainly a commendable project — provided (in our humble opinion) that the purpose is, *not* to read scientific papers to themselves, *but* to discuss new or disputed topics, subjects of technical interest; to consider questions peculiar to systematic Mycology; to ponder the distressing matter of nomenclature, as well as terminology, types, publication and illustration of new species, indexing, journalistic work, and a raft of other topics more or less exclusively pertaining to our business as specialists.



*Yours truly
F. S. Earle*

Journal of Mycology

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SOME WESTERN SPECIMENS.

A. P. MORGAN.

The following rarities occurred in a package of specimens from W. B. Anderson, Cumberland, B. C.

1. *Dothidea wittrockii* Eriksson, Fung. Scand. No. 40. *Phyllachora wittrockii* Saccardo, Sylloge II, 601.

This fungus grows at the extremities of the branches of *Linnaea borealis*. It has been found in the White Mountains. See article by Dr. Farlow in *Appalachia*, Vol. III, 247. These specimens however, were infertile. The specimens from British Columbia are well matured, affording both spores and asci.

2. *Cylindrodendrum album* Bonorden, Handbuch, p. 98, Fig. 127.

A curious white mould, *Hyphomyces*. I do not know that it has been found in this country before.

3. *Dianema corticatum* Lister, Mycetozoa, p. 205.

A *Myxomyces*, close akin to species of *Perichaena*. Lister's specimen was found in Norway. *Dianema harveyi* Rex, the type species of the genus was found in Maine. All the species appear to be very rare.

NOTE ON *CORTICIUM LEUCOTHRIX*, B. & C.

A. P. MORGAN.

I have recently gathered specimens of this curious fungus. It was first described by Berkeley in the *Notices of N. A. Fungi*; it is No. 284. The hymenium is truly "beset with delicate white bristles" as stated by Berkeley. These the hymenium had parted with when Massee redescribed the same specimen in the *Journal of the Linnean Society*, Vol. XXV, 133.

The species was referred to the "subgenus" *Coniophora*, by reason of "*Hymenium pulverulent*; spores large, profuse, colored," Grevillea, VIII, 89. It stands here *Corticium* (*Coniophora*) *leucothrix* B. & C. Massee writes it *Coniophora leucothrix* Cooke, in the *Journal of the Linnean Society*.

The peculiarity of the plant is the association of the white cystidia with the brown spores; the former pertain to the genus *Peniophora*, the latter are characteristic of the genus *Coniophora*. The cystidia of *Corticium leucothrix* are similar to those generally in the species of *Peniophora*; they are terete, tapering slightly to the apex, roughened with irregular warts, projecting 50-90 mic. beyond the surface of the hymenium, 12-15 mic. in thickness. The spores are subelliptic, inequilateral, yellow-brown, pellucid, 11-14 x 6-7 mic.

The cystidia in the genus *Peniophora*, after maturity, soon disappear, especially when the plants continue to be exposed to the weather; then the specimens are usually referred to *Corticium*. It can easily be shown that this has been done in more than one instance.

THE ACCENTUATION OF MYCOLOGICAL COMPOUND NAMES.

IVY KELLERMAN.

It seems that the perplexing question of correct formation and derivation is not the only matter in nomenclature which disturbs the botanist. The accentuation of names gives trouble now and again, in spite of the apparently simple rule for all anglicized Latin and Greek scientific words, that the Latin rule is to be followed, namely: accent the second syllable from the end if it be long; if it is short, accent the preceding one. But since these words are chiefly Greek compounds, some explanation of the laws underlying their accent before they suffer transliteration may replace apparent dogmatism with reasonableness in the mind

of the long-suffering mycologist, even though no practical rules are added.

By comparison of the languages of the Indo-European family, many apparently isolated facts are explained, and certain uniformities proved to exist. These uniformities may therefore be considered indications of the state in prehistoric times, before the development into separate languages. The members into which the Indo-European family separated are believed to be the following: Indo-Iranian (*i. e.*, Sanskrit, Avestan, Persian), Armenian, Albanian, Greek, Italic, Celtic, Teutonic, and Balto-Slavic.

There are certain Indo-European laws of accentuation which are seen to be distinct from changes occurring in the individual languages. One of the most general laws pertaining to nouns and adjectives may be stated as follows: Compounds, consisting of one word dependant upon another in a grammatical relation, keep the accent of the dependant word for the accent of the compound as a whole. The survival of the law to the present time is shown by such examples from the Teutonic branch as English *púff-ball*, *ápple-tree*, *bláck-berry*, or German *ápfel-wein*, *sónnen-blume*, *blaú-beere*. From the Balto-Slavic branch may be adduced Lithuanian *vasará-sziltis* "summer warmth", and *sául-zhole* "heliotrope," and Russian *né-vidko* "*not* to be seen." A moment's consideration will show how logical this law is. The dependant word, usually an adjective, or a noun in a case relation, brings a new idea or broadens the one already present in the word to which it is united, and so it naturally receives the greater amount of stress. The rule holds whether the dependant element precedes or follows the foundation word. This suggests a distinction which must here be emphasized, and which can be made plain by recalling a favorite example of two Greek words which differ only in their accent. One type is shown by *metro-któnos* "mother-slayer," developed by a secondary law from the original *metro-ktonós*. This class can be left out of consideration, when mycological nomenclature is the point of interest. The other class is exemplified by *metró-ktonos* "having death at a mother's hands", "mother-slain", the difference in sense being shown solely by its different accent. This is the type which botanical terminology for the most part follows.

In Sanskrit no secondary development obscures the law, and examples from this language are most plain: *sáhasra-mukha*, "having a thousand outlets", *híraya-keshas*, "gold-haired" (*i. e.*, "Gold-hair"), *hári-ashvas*, "having yellow horses." Greek examples are *polý-porus* from *polý-pórus*, and *aglaó-spora*, from *aglaó-sporá*, a correctly made new formation.

In Greek, however, which is of especial interest to the botanist, certain changes took place. A law developed that no accent might recede farther from the end of a word, either simple or

compound, than the third syllable from the end. This is the case if the quantity of the last syllable be short; if it is long, the accent may recede only as far as the second syllable from the end. It will at once be recognized that this secondary law often shifts the accent of the emphatic word in a compound to a different syllable from the one upon which it originally rested. For instance, *myrío-stóma* would in prehistoric Greek have become *myrío-stoma*, like the Sanskrit *sáhasra-mukha* of almost the same meaning quoted above. But, in the earliest records we have, Greek had already completed the shifting due to the law of recessive accent, and therefore we find *myrió-stoma*. So also *caryó-sporá*, if it had occurred in early Greek, would have been *caryó-spora*. The latinization of most of the mycological words of this type reduces the number of clear examples for illustration.

When the foundation word is more than three syllables in length, or has a long final syllable, it is evident that the law of recessive accent must withdraw the emphasis completely from the preceding dependant word. An example of this is *poly-céphalum*, which would have been *poly-cephalum* in prehistoric Greek, from the elements *poly-cephalé*, which naturally had to undergo such a compromise when they became united into one word. A still more apparent example is *cylindro-céphalum*; the first of its component parts is *cýlindro-*, which likewise had to give up its accent entirely, since it preceded a three-syllabled word in the combination.

NEW SPECIES OF FUNGI FROM VARIOUS LOCALITIES.

J. B. ELLIS AND B. M. EVERHART.

*SEPTORELLA** *SORGHII* E. & E. On leaves of *Sorghum halapense*, Tuskegee, Ala. (Prof. Geo. W. Carver, 383).

Perithecia gregarious on dry, dead areas of the leaves, superficial, globose, coarsely tubercular-roughened, subcarbonaceous, 80-100 μ diam. Sporules elongated-fusoid, slightly curved, 3-4-nucleate becoming faintly 3-4-septate, yellowish-hyaline, 40-55 x 2 μ . Basidia very short.

MACROPHOMA ULMICOLA E. & E. On dead elm twigs, Riverside, Ill., November, 1902. (E. T. & S. A. Harper, No. 781.) Comm. Elam Bartholomew.

Perithecia thickly scattered, white inside, apex erumpent. Sporules globose or shortly elliptical, large 15-20 μ in the longer

The genus *Septorella* was published in *Hedwigia* 1897, p. 241. The name is badly chosen, differing only in a single letter from *Septoriella* Oudemans, in his *Contributions à la Mycol. Flora des Pays-bas*, XIII, p. 52, but the fungus described by Oudemans is very different from the *Septorella* of Allescher, the *perithecia* in Prof. Oudemans's genus being enclosed in a dothideaceous stroma. The sporules in the species published by Allescher are smaller (18-22 x 1 μ) than in *s. sorghi*.

diameter. Probably the macrostylosporous stage of some *Botryosphaeria*.

DIAPORTHE (*CHOROSTATE*) *CONGESTA* E. & E. On dead limbs of *Pirus americana*. Sailors' Encampment, Mich., August, 1889. (E. T. & S. A. Harper, No. 784.) Comm. E. Bartholomew.

Stroma conic-globose, $\frac{1}{2}$ cm. diam., formed of the scarcely altered substance of the bark which is raised into subconical protuberances. Perithecia globose, $\frac{1}{2}$ mm. diam., lying in the bottom of the stroma and partly sunk in the subjacent wood, 20-30 in a stroma, abruptly contracted into slender necks which rise through the substance of the stroma, their obtuse slightly enlarged, hemispherical, papillate ostiola bursting through the epidermis in a densely crowded fascicle. Asci clavate-cylindrical, $60 \times 6 \mu$. Sporidia 8 in an ascus, oblong-fusoid, subbiseriate, hyaline, 3-4-nucleate, becoming uniseptate, $11-13 \times 2\frac{1}{2}-3 \mu$.

SOLENOPEZIZA *SYMPHORICARPI* E. & E. On decorticated, weather-beaten limbs of *Symphoricarpus* sp., Steamboat Springs, Colo. July 15, 1902. (Comm. E. Bartholomew.)

Ascomata scattered, centrally attached, about 1 mm. diam., clothed with a dense coat of dark-brown, coarse, septate hairs, $3-4 \mu$ diam. When fresh the ascomata open to slightly concave or nearly plane with the margin slightly incurved, nearly closed when dry. Asci clavate-cylindrical, sessile, $50-60 \times 6-7 \mu$, with filiform paraphyses. Sporidia biseriate, fusoid-oblong or subclavate oblong, becoming faintly uniseptate but not constricted.

When dry of about the same color as *Peziza arida* Phill. which it resembles but is not so distinctly hysteriform-incurved.

CIBORIA *DALLASIANA* E. & E. On a decaying log, Mt. Pocono, Pa. August, 1902. (Mrs. E. M. Dallas, No. 22.)

Ascoma shallow cup-shaped, nearly discoid, glabrous, margin entire, soon incurved, about 1 cm. diam., cartilagino-carnose, elastic, dirty grayish-white and faintly marked with radiating wrinkles extending from the summit of the stipe to the margin of the cup, disk rather darker, dull watery white, becoming liver-color. Asci cylindrical, $150 \times 8-10 \mu$. Paraphyses about as long as the asci, mostly recurved and spatulate-swollen at the tip. Sporidia biseriate above, oblong-fusoid, slightly curved, subinequilateral, hyaline, filled with granular matter, $22-32 \times 5-6 \mu$. Stipe slender, subequal, or slightly enlarged at base, concolorous, $1-1\frac{1}{2}$ cm. x about $\frac{1}{2}$ mm.

HELOTIUM *PARASITICUM* E. & E. Parasitic on some old *Valsa*?, Harraby, Ontario, Canada, Sept., 1902. (E. T. & S. A. Harper, No. 609.) Com. E. Bartholomew.

Stipitate, subcespitose or solitary, orange-yellow. Ascoma $\frac{1}{4}-\frac{1}{2}$ mm. diam., concave, glabrous, margin subacute, stipe central, short, not exceeding 1 mm. Asci clavate-cylindrical, $45-50 \times$

4-5 μ , paraphysate. Sporidia subbiserate, ovate-oblong, hyaline, continuous, 4-4 $\frac{1}{2}$ x 1 $\frac{1}{4}$ -1 $\frac{1}{2}$ μ .

This is different from *Peziza sphaenicola* Schw. which is described as strigose and brown with a white margin.

TREMATOSPHERA CLAVISPORE E. & E. On dead limbs of *Artemisia tridentata*, Steamboat Springs, Colorado, July, 1902. (Bethel 937.)

Scattered, superficial, easily deciduous, ovate-conical, not polished $\frac{1}{2}$ - $\frac{3}{4}$ mm. high or broad. Asci clavate-cylindrical, stipitate, p. sp. 70-75 x 11-13 μ , with abundant filiform paraphyses. Sporidia biseriate, clavate fusoid, slightly curved, 6-septate and slightly constricted at 2 or 3 of the middle septa, subhyaline at first, becoming yellow-brown. Seems easily distinct from any of the described species. The prominent conic-cylindrical ostium is soon deciduous, leaving the perithecia broadly perforated.

CUCURBITARIA TYPHINA E. & E. On dead stems of *Rhus typhina*, Harraby, Lake Resseau, Ont., Canada, Sept. 1902. (E. T. & S. A. Harper, No. 607.) Com. E. Bartholomew.

Perithecia subglobose, about $\frac{1}{2}$ mm. diam., bursting through the bark 2-6 together. Ostium papilliform, inconspicuous, sometimes slightly compressed. Asci cylindrical, 120-150 x 15 μ , attenuated below into a stipe-like base, 8-spored. Paraphyses obscure or wanting. Sporidia uniseriate, oblong or oblong-elliptical, obscurely about 6-septate and muriform, scarcely constricted, straw yellow, 22-27 x 12 μ , finally opaque with the end cells subapiculate and hyaline.

The perithecia are of a firm texture and white inside. This differs from *C. stenospora* E. & E. on *Rhus diversiloba* in its broader sporidia.

SPHAERELLA (MYCOSPHAERELLA) CAESPITOSA E. & E. On leaves of *Quercus virginiana*, Meridan, Texas, Apr. 1901. (W. H. Long, No. 957.) Com. E. Bartholomew.

Hypophyllous. Perithecia minute (65-75 μ), subconfluent-cespitose, 3-5 together forming a little tuft surrounded by the ruptured epidermis, the separate tufts collected in groups 1-3 mm. across. Asci subcylindrical, 35-40 x 5-6 μ diam. Sporidia subbiseriate, oblong-fusoid, 1-septate, not constricted, 8-10 x 2 $\frac{1}{2}$ -3 μ , hyaline.

SPHAERELLA (MYCOSPHAERELLA) SALICINA E. & E. On dead shoots of *Salix cordata*, Rooks Co., Kansas, May, 1902. (Bartholomew, 2949.)

Perithecia scattered or collected in little groups of 3-5, ovate, $\frac{1}{4}$ - $\frac{1}{3}$ mm. diam., and a little more than that in height, seated on the surface of the inner bark, and raising and rupturing the thin epidermis to which they adhere and come off with it when the epidermis is peeled off. It is then seen that they are strongly collapsed from below. Asci (p. sp.) oblong, 40-45 x 8-10 μ .

Sporidia biseriate or oblike, oblong-fusoid, hyaline or with a yellowish tint, uniseptate in the middle and slightly constricted, $14-18 \times 4-6\mu$.

METASPHAERIA SILPHII E. & E. On dead stems of *Silphium integrifolium*, Rooks Co., Kansas, May 1902. (Bartholomew 2951).

Perithecia gregarious, subcuticular becoming superficial when the cuticle falls away, ovate, rough except the upper part and the papilliform ostiolum, soon collapsing to cup-shaped, $150-200 \mu$ diam. Asci cylindrical or clavate-cylindrical, $45-55 \times 6-7 \mu$, rather abruptly contracted into a short, stipe-like base, paraphysate. Sporidia biseriate or oblike, fusoid-oblong, 2-3-septate, constricted at the septa, $12-16 \times 3\frac{1}{2}-4\mu$, slightly brownish. In some perithecia the sporidia are 2-septate and in others all 3-septate.

CRYPTOVALSA PIRINA E. & E. On dead limbs of *Pirus coronaria*, River Forest, Ill. Oct. 1902. (E. T. & S. A. Harper, 600.) Com. E. Bartholomew.

Stroma effused, blackening the inner bark and the surface of the wood beneath. Perithecia ovate-globose, with thick, coriaceous walls, the inner cavity mostly less than $\frac{1}{2}$ mm. diam., collected in valsoid groups (generally 4-8), with short necks, their entire or faintly sulcate, obtuse or subconical ostiola erumpent in an acutely elliptical or round disk which bursts out through short, transverse cracks in the thick epidermis. Asci polysporous, on long, slender pedicels, p. sp. $65-70 \times 10-12 \mu$. Sporidia allantoid, yellowish, not strongly curved, $11-13 \times 1\frac{1}{2}-2\mu$.

This differs from *C. protracta* (Pers.), *C. nitschkei* Fckl., and *C. rabenhorstii* (Nitsch.) in its ostiola being collected in an erumpent disk.

VALSELLA MINIMA NISSL. Not. Kr. Pyr. p. 53. What we take to be this species has been sent by Prof. E. T. Harper, from Indiana, on *Sambucus canadensis*.

Stroma $\frac{1}{2}-\frac{3}{4}$ mm. diam., sunk in the inner bark which is uniformly blackened on the surface. Perithecia 3-6 in a stroma, angular from mutual pressure, white inside, minute, about 200μ in diameter. Sporidia $8-10 \times 1\frac{1}{2}-2\mu$. Ostiola scarcely penetrating the minute, white, farinaceous disk.

ANTHOSTOMELLA THYRIDIOIDES E. & E. On decorticated, weather-beaten limbs of *Populus deltoides*, Rooks Co., Kansas. July 1902. (Bartholomew 2969).

Perithecia gregarious, one or two together, globose, thin walled, sunk in the wood without any definite stroma and raising the surface of the wood into short, subelongated pustules pierced by the papilliform ostiola and blackened by the discharged sporidia. Asci clavate-cylindrical, $70-75 \times 10-12\mu$, paraphysate. Sporidia oblong-cylindrical, continuous, brown, $15-22 \times 4-6 \mu$. Has the aspect of *Thyridium*.

MYRMAECIUM FRAXINEUM E. & E. On dead limbs of *Fraxinus viridis* (?). River Forest, Ill. Oct. 1902. (E. T. & S. A. Harper, 599.) Com. E. Bartholomew.

Perithecia ovate-elliptical, $100-125\mu$ diam., slightly sunk at first in a soft, whitish stroma, soon erumpent in densely crowded clusters, $3-1\frac{1}{2}$ mm. across, flattened above and erumpent through the epidermis, black outside, white within. Asci cylindrical, p. sp. about $75 \times 8-10\mu$, paraphyses, if any, very evanescent. Sporidia uniseriate or biseriate above, ovoid, hyaline with a distinct olivaceous tint, uniseptate and more or less constricted at the septum, $12-14 \times 5-6\mu$.

This comes very near *M. endoleucum* Sacc. and may not be distinct from that species, the only difference being in the subolivaceous, constricted sporidia.

DIATRYPELLA VETUSTA E. & E. On a decorticated, partly decayed stick lying on the ground, River Forest, Ill. Oct. 1902. (E. T. & S. A. Harper, No. 596.) Comm. E. Bartholomew.

Stromata thickly scattered, erumpent-superficial, $\frac{3}{4}-1\frac{1}{2}$ mm. diam., black, uneven above from the slightly prominent, obtuse, smooth ostiola. Asci clavate-cylindrical, $75-80 \times 8-10\mu$, paraphyses obscure. Sporidia allantoid, yellowish, crowded in the asci, slightly curved ends obtuse.

A faint but deeply penetrating black line surrounds the part occupied by the fungus.

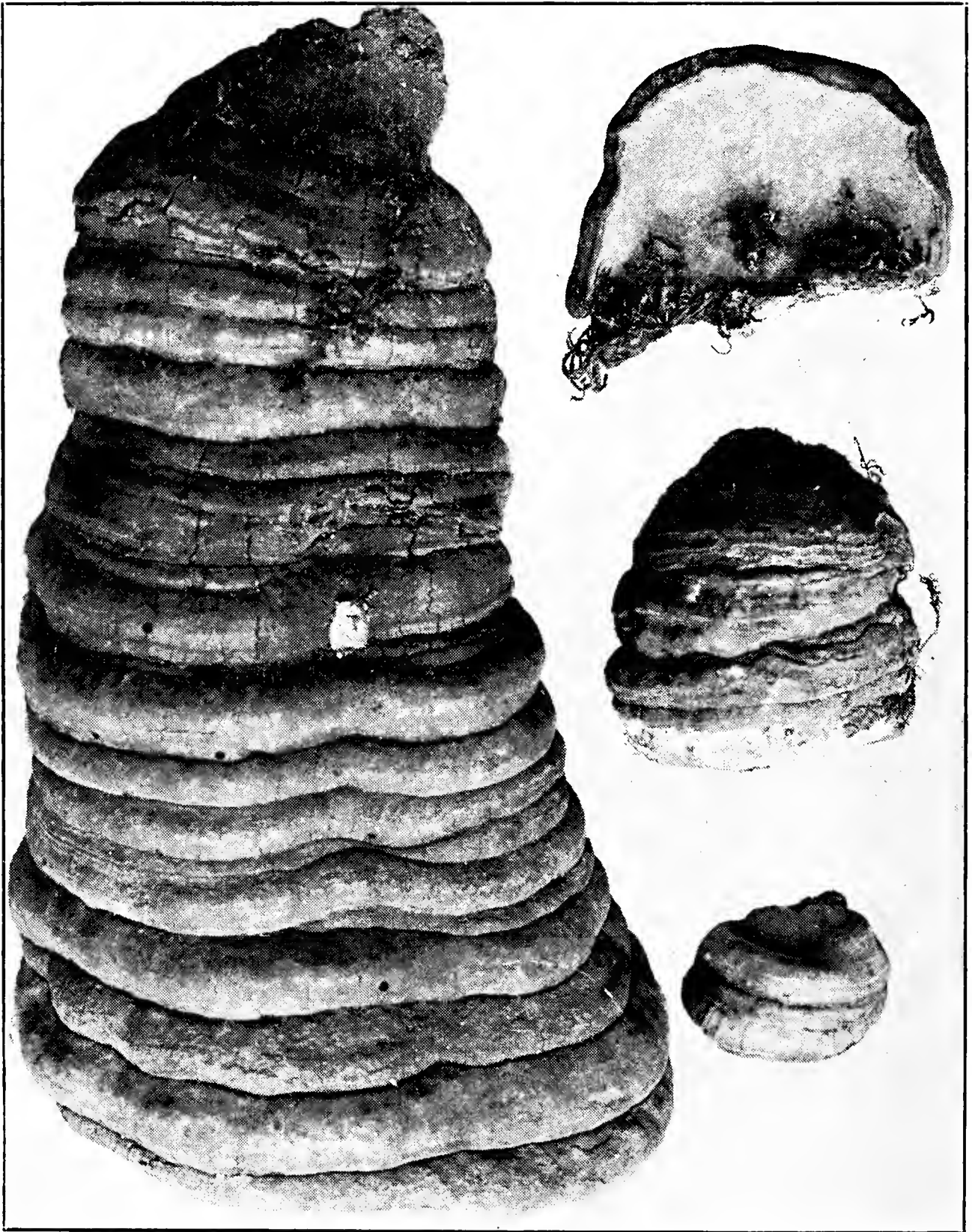
MELANOPSAMMA UTAHENSIS E. & E. On dead stems of *Actaea rubra*, Salt Lake, Utah. Aug. 1903. (A. O. Garnett, No. 287.)

Perithecia gregarious, at first covered by the cuticle, soon superficial, subglobose, becoming slightly depressed or flattened at the top, about $\frac{1}{2}$ mm. diam. Asci clavate cylindrical, narrowed at the base into a short stipe, $75 \times 12\mu$, Paraphyses evanescent. Sporidia subbiseriate, clavate oblong, hyaline, uniseptate, constricted near the middle, slightly curved, $25-30 \times 6-7\mu$, lower cell narrower.

M. caulicola Rehm on *Salvia* is the (only ?) other cauliculous species described. The conic-papilliform ostiolum with a round opening will separate it from *Lophiosphaeria*.

CERCOSPORA PLATANICOLA E. & E., Jour. Mycol. 3:17. Feb. 1887.

Well matured specimens of this species collected at Mingo, W. Va., Sept. 1903, have the conidia larger, $30-55 \times 4-5\mu$ and smoky hyaline. The spots become confluent and the entire leaf becomes brown and dead.



ELFVINGIA FOMENTARIA (L.) Murrill.

(From photograph of specimens on *Betula lutea*, collected in the Cheat Mountains of West Virginia. Reduced to nearly one-fourth natural size.)

MINOR MYCOLOGICAL NOTES. I.

W. A. KELLERMAN.

It may possibly be worth while to put on record occasional notes on fungi of more or less interest, here and there observed incidentally. These may pertain to distribution, habit, habitat, or any other single phase — but paragraph-headings will be used to enable the reader to select any note that may be of probable interest.

PUCCINIA VERATRI.—This Rust was observed in enormous abundance in the Cheat Mountains, alt. 3,600 ft., near Cheat Bridge, Randolph Co., West Virginia. Along the Cheat River the host occurred in great quantity, and every plant noticed was affected. Usually every leaf contained the Rust, and mostly the entire surface was thoroughly blackened by the parasite.

ELFVINGIA FOMENTARIUS (*FOMES FOMENTARIUS*).—This Polypore is a widely distributed species, Europe, Asia, North America; said to occur on Birch and Beech. "*Hab. ad Fagos abunde optimus, vegetior copiosum fomentum molle quotannis edens, minor, macrior et durior ad Betulas etc.*" (Saccardo). It was noticed as the commonest species (save perhaps here and there the *Elfvingia megaloma* (*Polyporus leucophæus*, or *Fomes applanatus* as usually recorded) in the Mountains of West Virginia. In the uncleared forest regions old trees and prostrate trunks were the conspicuous matrix for the saprophyte — but it occurred almost exclusively on the Yellow Birch, a very common tree in the section referred to. It was seen, but very rarely, also on Beech and Nyssa. The climate can perhaps as well as the host, be regarded as very agreeable to this conspicuous fungus; on numerous trunks, standing or occasionally felled, young plants and those of mature age — say twenty years — were seen. It was thought that a photograph of some of the plants might not be amiss in connection with a note—and on the page opposite is given a half-tone reproduction (Plate III) showing some young plants, one with the hymenium in view, and a sample of one of age.

LATE INFECTION OF PHYLLOSTICTA ASIMINÆ.—A quantity of this fungus was found this season coming to maturity as late as the middle of October. It had been observed in the same locality in this and previous years developing its spores at the usual time—early in the summer. A portion of the thicket of papaw bushes of considerable area was removed by plow and road scraper during the season and then left undisturbed, when young sprouts appeared in great abundance. It was on these leaves, developed late in the season, that extensive infection was noticed, and careful examination showed that the

perithecia were full of ripe or nearly ripe spores—the usual severe frosts of September and October disturbing the life neither of host nor parasite. The perithecia were very numerous on the spots, often more abundant than the usual infection. Very many of them appeared at both the upper and lower surface of the leaves—which is not common for this species. The original description, as published by Ellis and Kellerman, was based on ma-

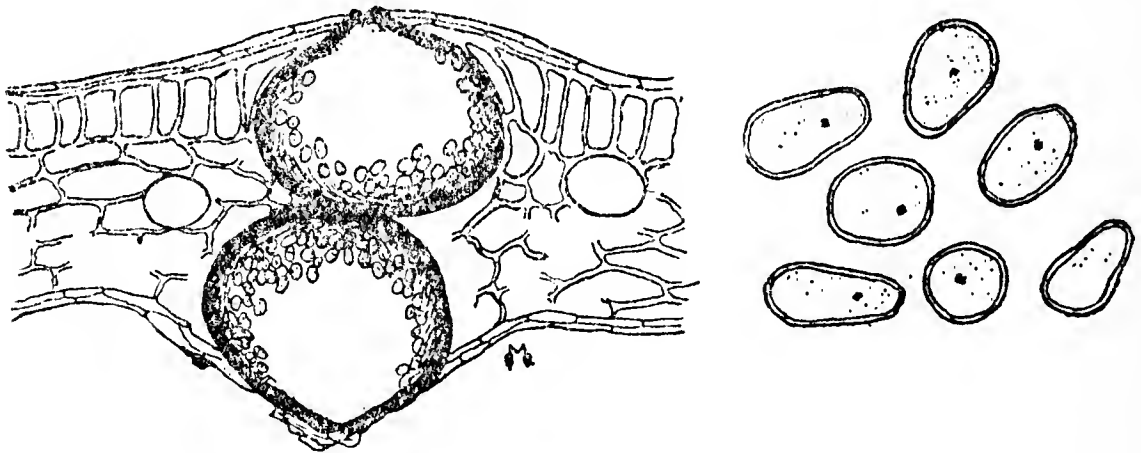


Fig. 3. *Phyllosticta asiminae* Ell. & Kellerm.

terial collected in July (1883), in Fairfield County, Ohio; in this the perithecia were epiphyllous, and the spores were found to be $7-9 \times 5-6 \mu$. The recently collected October material showed spores with the characteristic color but mostly 10μ in length and 6 or 7μ in width. No figures were furnished originally and hence a sketch is presented here. The leaf section shows a perithecium situated near each epidermal surface; highly magnified outline figures of the spores appear at the right.

RUST ON MUHLENBERGIA DIFFUSA. — It was stated on page 109 of this JOURNAL that cultures had demonstrated the connection of *Puccinia muhlenbergiae* Arthur on *Muhlenbergia mexicana* and *Aecidium hibisci* Schw. on *Hibiscus moscheutos* (to which may be added *Hibiscus militaris*). But strange as it may seem, the *Puccinia muhlenbergiae* Arthur on *Muhlenbergia diffusa*, also used in the cultures (which will be reported in detail later) yielded only negative results. For the present therefore the name *Puccinia hibisciata* (Schw.) Kellerm. (Jour. Mycol. 9:110, May, 1903) can be used only for the Rust on *Muhlenbergia mexicana*, at any rate not that occurring on *Muhlenbergia diffusa*. Additional cultures will be instituted next season; material will be furnished to any experimenters who may care to cooperate in this interesting case.

OHIO FUNGI. FASCICLE VIII.

W. A. KELLERMAN, OHIO STATE UNIVERSITY.

List of Species and Hosts.

141. *Cercospora caulophylli* Peck, on *Caulophyllum thalictroides* (L.) Michx.
 142. *Cercospora cana* Sacc., on *Erigeron annuus* (L.) Pers.
 143. *Gloeosporium nervisequum* (Fuck.) Sacc., on *Platanus occidentalis* L.
 144. *Melampsora populina* (Jacq.), on *Populus grandidentata* Mx.
 145. *Melampsora populina* (Jacq.), Lév., on *Populus tremuloides* Mx.
 146. *Phyllosticta labruscae* Thüm., on *Vitis vulpina* L.
 147. *Plasmopara australis* (Speg.) Humph., on *Sicyos angulatus* L.
 148. *Puccinia caricina* DC., on *Carex comosa* Boott.
 149. *Puccinia caricina* DC., on *Carex squarrosa* L.
 150. *Puccinia caricis-asteris* Arth., *Aecidium*, on *Aster paniculatus* Lam.
 151. *Puccinia caricis-asteris* Arth., *Aecidium*, on *Aster tradescanti* L.
 152. *Puccinia glechomatis* DC., on *Agastache nepetoides* (L.) Kuntze. (*Lophanthus nepetoides* Benth.)
 153. *Puccinia helianthi* Schw., on *Helianthus hirsutus* Raf.
 154. *Puccinia violae* (Schum.) DC., *Aecidium*, on *Viola scabriuscula* (T. & G.) Schw.
 155. *Puccinia violae* (Schum.) DC., on *Viola striata* Ait.
 156. *Septoria erigerontis* Peck, on *Erigeron ramosus* (Walt.) B. S. P.
 157. *Septoria rhoina* B. & C., on *Rhus radicans* L.
 158. *Stichopsora solidaginis* (Schw.) Diet., on *Solidago ulmifolia* Muhl.
 159. *Stichopsora vernoniae* (B. et C.) Diet., on *Vernonia fasciculata* Mx.
 160. *Uromyces euphorbiae* Cke. & Peck, on *Euphorbia nutans* Lag.

141. *Cercospora caulophylli* Peck.On *Caulophyllum thalictroides* (L.) Michx.

Sugar Grove, Fairfield Co., O.

May 16, 1903.

Coll. W. A. Kellerman.

"*Cercospora Caulophylli*, *n* sp. Spots irregular or suborbicular, dark-brown or grayish with a dark-brown margin; flocci hypophyllous, tufted, flexuous, nodulose above, colored, rarely branched; spores oblong or cylindrical, with one to three septa, colorless, .0008 in. to .0012 in. long, .00025 in. to .0003 in. broad. Living or languishing leaves of cohosh, *Caulophyllum thalictroides*." Chas. H. Peck, Annual Report of the State Museum, New York, 33:30. 1880.

142. Cercosporella cana Sacc.

On *Erigeron annuus* (L.) Pers.

Buckeye Lake, Fairfield Co., O. June 13, 1903.

Coll. W. A. Kellerman.

"*Cercospora cana* Sacc. (sp. nov.)"

Selva (Trevico) in foliorum pagina inferiori *Erigerontis canadensis*, Augusto. 1875.

"Obs. ob hyphas hyalinas ad *Ramulariam* vergit, sed conidia cylindracea obclavata, 60-90 x 4-5, 3-4 septata, porosus *Cercosporae*." P. A. Saccardo, *Michelia*, 2:362. 1881.

143. Gloeosporium nervisequum (Fuck.) Sacc.

On *Platanus occidentalis* L.

Sandusky, Erie Co., O. July 28, 1903.

Coll. W. A. Kellerman.

"*Fusarium nervisequum*."

a. *Platani*.—F. rh. 427.—*Hymenula Platani* Lév. in Desm. Exs. 1349. Tuberculis liberis, adnatis, rotundatis, ovatis oblongisve, planis, rugulosis, in macula exarida seriatim dispositis, fuscis, demum aterrimis, longitudinaliter dehiscentibus; conidiis oblongo-ovatis, hyalinis, 12 Mik. long., 4 Mik. crass. Tab. I. Fig. 37. conid.

"An den lebenden Blättern, die Blattrippen verfolgend, von *Platanus orient.*, oft sehr häufig und das frühe Abfallen der Blätter bewirkend, im Sommer." L. Fuckel, *Symbolae Mycologicae*, 369. 1869.

144. Melampsora populina (Jacq.) Lev.

On *Populus grandidentata* Mx.

Bowling Green, Wood Co., O. Sept. 17, 1902.

Coll. W. A. Kellerman.

Supplement to No. 45.

145. Melampsora populina (Jacq.) Lev.

On *Populus tremuloides* Mx.

Bowling Green, Wood Co., O. Sept. 17, 1902.

Coll. W. A. Kellerman.

Supplement to No. 45.

146. *Phyllosticta labruscae* Thuem.On *Vitis vulpina* L.

Sandusky, Erie Co., O.

July 20, 1903.

Coll. W. A. Kellerman.

“*Phyllosticta Labruscae* Thüm. nov. spec.

“Ph. peritheciis mediis, dense gregariis, numerosis, sine ordine dispositis, epiphyllis, hemisphaericis, prominentibus, atris in macula suborbiculari, distincte limitata, lineam brunneam cincta, exarida, rufofusca, epiphylla, in pagina inferiore maculam pallidam fuscescentem, indistinctam formans; sporis numerosis, oblongis, regularibus, utrinque rotundatis, diaphanis, episporio tenui, achrois, intus grumulosus, 9-11 mm. long., 6-7 mm. crass.” Felix von Thümen, Die Pilze des Weinstockes, 189. 1878.

147. *Plasmopara australis* (Speg.) Humph.On *Sicyos angulatus* L.

Sandusky, Erie Co., O.

July 27, 1903.

Coll. W. A. Kellerman.

“*Peronospora australis* Speg. (n. sp.)

“*Diag.* Hypophylla; maculae amphigenae, magnitudine ludentes primo parvulae, dein saepe totum folium occupantes, pallescentes v. fusco-pellucidescentes, angulosae; hyphae mycelii crassae, subtorulosae; haustoria subsphaeroidea, v. subclavata, numerosa, saepe totam cellulam plantae hospitalis implectentia; hyphae fertiles hinc inde erumpentes v. e stomatibus exsurgentes, rectae, cylindratae, longiusculae, (250-500 x 14-15), hinc inde glomeratae, usque ad verticem continuatae, inferne saepe incrassatae, sed mox brevitur ac abrupte coarctato-attenuatae, apice subverticillatim 5-12 ramosae; rami 3-6 ies tricothomi, gradatim attenuati, ac abbreviati; ramuli ultimi apice incrassatuli 3-5 sterigmata (3,5 x 1,5-2) hyalina, subampulliformia, inter se angulo recto divergentia, saepe 2-3- denticulato-lobata gerentia; conidia obovato-sphaeroidea, sursum obtuse rotundata, inferne rotundato acutata, saepeque apiculata (15 x 10-12), hyalina.

“*Hab.* Ad. folia viva *Cyclantherae hystricis* in dumetis uliginosis prope la Recoleta, Aut. 1881.” Auctore Carolo Spegazzini. Fungi Argentini additis nonnullis. Brasiliensibus Montevideensibusque. Pugillus Quartus, p. 36, in Anales Sociedad scientifica argentina, Buenos Aires, 12:81. 1881.

148. *Puccinia caricina* DC.On *Carex comosa* Boott.

Columbus, Ohio.

Oct. 8, 1903.

Coll. W. A. Kellerman.

Supplement to No. 28.

149. *Puccinia caricina* DC.

On *Carex squarrosa* L.

Columbus, Ohio.

Oct. 27, 1902.

Coll. W. A. Kellerman.

Supplement to No. 28.

150. *Puccinia caricis=asteris* Arth.

Aecidium.

On *Aster paniculatus* Lam.

Columbus, Ohio.

May 24, 1903.

Coll. W. A. Kellerman.

"*AECIDIUM Asterum* Sz.

"*A. effusum confluens tenuissimum pallide purpurascens, peridiis aggregatis immersis, pulvere albo.*

"*Passim in foliis et caulibus Asterum glabrifoliorum.*—Sporidia majuscula vesiculosa, globosa aut oblonga simplicia." L. D. de Schweinitz, Synopsis Fungorum Carolinae Superioris (excerpta), p. 41. No. 444. 1882. (Schrift. d. Nat. Gessellschaft zu Leipzig.)

"*PUCCINIA CARICIS-ASTERIS* sp. nov.

"O. Spermogonia epiphyllous, yellow, punctiform, sunken in tissue of the leaf.

"I. Aecidia hypophyllous, collected in groups on slightly swollen yellow or purplish spots, low, margin much divided and recurved; aecidiospores subglobose, 12-17 μ in diameter, wall thin, minutely roughened.

"II. Uredosori hypophyllous, oblong; uredospores oblong or obovate, 12-16 by 18-22 μ ; wall thin, echinulate; pores few, scattered.

"III. Teleutosori hypophyllous, oblong to oblong-linear, prominent, soon naked, dark brown, ruptured epidermis noticeable; teleutospores oblong or clavate-oblong, 16-22 by 48-56 μ .; apex rounded, greatly thickened; pedicel slender, colored, half the length of the spore." J. C. Arthur, Journal of Mycology, 8:54. June 1902.

151. *Puccinia caricis=asteris* Arth.

Aecidium.

On *Aster tradescanti* L.

Buckeye Lake, Fairfield Co., O.

June 13, 1903.

Coll. W. A. Kellerman.

Supplement to No. 150.

152. Puccinia glechomatis DC.

On *Agastache nepetoides* (L.) Kuntze. (*Lophanthus nepetoides* Benth.)

Sandusky, Erie Co., O.

Aug. 1, 1903.

Coll. O. E. Jennings.

"*Aecidium verrucosum*.

"*A. cespitosum* difforme subconfluens purpureum; peridiis fusco-flavescentibus maculae purpureae insidentibus; pulvere badio conglomerato indurato." Auctore Carolo Friederico Schultz, *Prodromus Florae Stargardiensis*, 452. 1806.

"*UREDO*, puccinie du lierre terrestre. *Puccinia glechomatis*. Decand.

"*Puccinia caespitulis rufis hypophyllis, saepius annulatim dispositis stipite albo, filiformi capsula tereti, obtusa; isthmo bi seu triloculari*. Decand. MSS. no. 8.

"*Puccinia (affinis), conferta, orbiculari modo disposita, non disruptens; sporangiis obtusis, cylindrico-ovatis, variis, glabris dissepimento uno duobus; filamentis longissimis*. Hedw. f. *Fung. inedit.* tab. 9.

"Elle couvre de taches, d'un jaune-roussâtre, la surface inférieure des feuilles du lierre terrestre. Ces taches sont orbiculaires ou disposées en anneaux assez rapprochés, qui soulèvent l'épiderme sans le déchirer. Les pédicelles sont filiformes, de couleur blanche; ils se terminent par des capsules glabres, un peu variées dans leurs formes, cylindriques, quelquefois presque ovales, obtuses à leur sommet, divisées en deux ou trois loges par autant d'étranglements transversaux." *Encyclopédie Méthodique, Botanique*, 245. 1808.

153. Puccinia helianthi Schw.

On *Helianthus hirsutus* Raf.

Sandusky, Erie Co., O.

Aug. 5, 1903.

Coll. W. A. Kellerman.

Supplement to No. 10.

154. Puccinia violae (Schum.) DC.

Aecidium.

On *Viola scabriuscula* (T. & G.) Schw.

Columbus, Ohio.

May 4, 1903.

Coll. O. E. Jennings and J. G. Sanders.

Supplement to No. 132.

155. Puccinia violae (Schum.) DC.

On *Viola striata* Ait.

Columbus, Ohio.

Oct. 7, 1903.

Coll. O. E. Jennings.

Supplement to No. 96.

156. *Septoria erigerontis* Peck.

On *Erigeron ramosus* (Walt.) B. S. P.
Columbus, Ohio. May 19, 1903.
Coll. W. A. Kellerman.
Supplement to No. 136.

157. *Septoria rhoina* B. & C.

On *Rhus radicans* L.
Sandusky, Erie Co., O. Aug. 17, 1903.
Coll. W. A. Kellerman.

"*Septoria rhoidis* B. & C.—Maculis parvis albis, margine lato nigro cinctis; perithecio centrali, sporis vermiformibus.

"On leaves of *Rhus*. New England, Sprague. No. 5769.

"Spots minute, white, with a broad black border; perithecium solitary; spores long, tolerably thick, .003 long, slightly flexuous. It is not the same species with *Septoria Rhois*, Lév." M. J. Berkeley, *Grevillea*, 3:8. Sept. 1874.

158. *Stichopsora solidaginis* (Schw.) Diet.

On *Solidago ulmifolia* Muhl.
Columbus, Ohio. Oct. 8, 1903.
Coll. W. A. Kellerman.
Supplement to No. 85.

NOTE—The nomenclature here followed is that given by Dietel, *Beiblatt zur Hedwigia*, 42(181), 4 July 1903. The name for this species on label No. 85 is *Coleosporium solidaginis* (Schw.) Thüm.

159. *Stichopsora vernoniae* (B. et C.) Diet.

On *Vernonia fasciculata* Mx.
Marietta, Ohio. Sept. 20, 1903.
Coll. W. A. Kellerman.
Supplement to No. 86.

NOTE—The nomenclature is here given as published by Dietel in *Beiblatt zur Hedwigia*, 42(179), 4 July 1903. The name on label No. 86 is *Coleosporium vernoniae* B. & C.

160. *Uromyces euphorbiae* Cke. & Peck.

On *Euphorbia nutans* Lag.
Columbus, Ohio. Oct. 8, 1903.
Coll. W. A. Kellerman.
Supplement to No. 36.

INDEX TO NORTH AMERICAN MYCOLOGY.

Alphabetical List of Articles, Authors, Subjects, New Species and Hosts, New Names and Synonyms.

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W. A. Kellerman.

ACER, wood and bark, host to *Sirothecium nigrum* Morgan n. sp., Jour. Mycol. 9:83. May 1903.

ACRASIEAE, Dictyostilieae or, *see Dictyostilieae* or . . .

AECIDIUM aikenii Syd. n. sp., in foliis vivis Thalictri purpurascens. Ann. Mycolog. 1:334. July 1903.

AECIDIUM claytoniatum Schw., *see Caeoma (Aecidium) claytoniatum* . . .

AECIDIUM clibadii Syd. n. sp., in foliis vivis Clibadii donnell-smithii. Ann. Mycolog. 1:333. July 1903.

AECIDIUM hibisciatum, The Alternate Form. [*Puccinia muhlenbergiae* Arth.; inoculation experiments.] W. A. Kellerman. Jour. Mycol. 9:109-110. May 1903.

AECIDIUM hibisciatum Schw., *syn. of Puccinia hibisciata* q. v. .

AECIDIUM osmorrhizæ Peck, *syn. of Puccinia osmorrhizæ* q. v.

AECIDIUM purpusiorum P. Henn. n. sp., an Früchten von Crataegus. Beiblatt zur Hedwigia, 42:(189). 4 Juli 1903.

AESCLUS octrandra, host to *Cercospora aesculina* Ell. & Kellerm. n. sp. Jour. Mycol. 9:105. May 1903.

AGAVE sp., host to *Hypocrea agaves* Maublanc n. sp. Bull. Soc. Mycolog. de France, 19:292. 1903.

ANTIRRHINUM vagans, host to *Puccinia antirrhini* Diet. & Holw. Jour. Mycol. 9:81. May 1903.

APPLE, host to *Hypochnus* sp. undescribed (H. J. Eustace). N. Y. Agr. Exp. Sta. Bull. 235:123-131. Pl. I-IV. July 1903.

APPLE rot, *see Decays, Two, of Stored Apples.* . .

ARISTOLOCHIA macrophylla, host to *Cercospora guttulata* Ell. & Kellerm. Jour. Mycol. 9:105. May 1903.

ARRACACIA hartwegi S. Wats., *see Velaea hartwegi* . . .

ASCOCHYTA coronaria Ell. & Davis n. sp., on living leaves of *Pyrus coronaria*. Trans. Wisc Acad. Sci. Arts & Let. 14:94 1903.

ASCOCHYTA lophanthi Davis n. sp., on Lophanthus scrophulariæ-folius Benth. Trans. Wisc. Acad. Sci. Arts & Let. 14:95. 1903.

ASCOCHYTA rufomaculans (Berk.), syn. of *Glomerella rufomaculans* q. v.

ASPARAGUS Rust, see *Rust, Asparagus* . . .

BACTERIA and the Nitrogen Problem. George T. Moore. Year book U. S. Dept. Agr. 1902:333-342. Pl. XXXVIII-XLII. 1903.

BACTERIA of the Soil. N. S. Mayo and A. T. Kinsley. Kansas Exp. Sta. Bull. 117:167-184. May 1903.

BACTERIOLOGY for High Schools. II. (Methods and directions; illustrations.) W. D. Frost and E. G. Hastings. Jour. Appl. Micr. & Lab. Meth. 6:2270-3. April 1903.

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BACTERIOLOGY for High Schools. IV. (Microscopical examination of Bacteria, continued.) W. D. Frost and E. G. Hastings. Jour. Appl. Micr. & Lab. Meth. 6:2426-8. July 1903.

BANK, damp among moss, matrix to *Scutigera whiteae* Murrill n. sp. Bull. Torr. Bot. Club, 30:432. Aug. 1903.

BITTER Rot of Apples. Hermann von Schrenk and Perley Spaulding. U. S. Dept. Agr. Bureau Pl. Industry, Bull. 44: 1-54. Pl. I-VIII. 18 July 1903.

BITTER-ROT fungus, see *Fungus, the Bitter-rot*. . .

BLASDALE, W. C. On a Rust of the Cultivated Snapdragon. (*Puccinia antirrhini*.) Jour. Mycol. 9:81-2. May 1903.

BOGUE, E. E. Collecting and Preserving Lichens. Jour. Appl. Micr. & Lab. Meth. 6:2373-4. June 1903.

BOLETUS betulinus Bull., syn. of *Piptoporus suberosus* q. v. . . .

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BOLETUS fomentarius L., syn. of *Elfvigia fomentaria* q. v. . . .

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BOTRYOSPORIUM longibrachiatum (Oud.) R. Maire [*Botrytis longibrachiata* Oud., *B. (Polyactis) doryphora* Pound et Clements, *Botryosporium pulchellum* R. Maire, *Cephalosporium dendroides* Ell. & Kell., nec *Botryosporium pyramidale* Cost., — sec. R. Maire.] Ann. Mycolog. 1:341. July 1903.

- BOTRYOSPORIUM pyramidale Cost. (*B. leucostachys* Zopf.) not a synonym of *Botryosporium pulchellum* [Sec. R. Maire]. *Ann. Mycolog.* 1:341. July 1903.
- BOTRYOSPORIUM pyramidale Costantin, *syn. of Botryosporium pulchrum* Corda. *Jour. Mycol.* 9:107. May 1903.
- BOTRYOSPORIUM pulchellum R. Maire, *syn. of Botryosporium longibrachiatum* q. v.
- BOTRYOSPORIUM pulchellum R. Maire, *syn. of Botryosporium pulchrum* Corda. *Jour. Mycol.* 9:107. May 1903.
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- BOTRYTIS longibrachiata Oudemans, *syn. of Botryosporium pulchrum* Corda. *Jour. Mycol.* 9:107. May 1903.
- BOTRYTIS (Polyactis) doryphora Pound et Clements, *syn. of Botryosporium longibrachiatum* q. v.
- BOTRYTIS (Polyactis) doryphora Pound & Clements, *syn. of Botryosporium pulchrum* Corda. *Jour. Mycol.* 9:107. May 1903.
- BROMUS ciliatus L., host to *Septoria brevispora* Ell. & Davis n. sp. *Trans. Wisc. Acad. Sci. Arts & Let.* 14:99. 1903.
- BULLETINS 15 & 16, Boston Mycological Club. Hollis Webster, Sec. [Coprinus in U. S., descriptions. Edwin A. Daniels.] June 1901.
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- CAEOMA (Aecidium) claytoniatum Schw., *syn. of Puccinia claytoniata* q. v.
- CALAMAGROSTIS canadensis Beauv., host to *Mastigosporium album clavum* Ell. & Davis n. var. *Trans. Wisc. Acad. Sci. Arts & Let.* 14:98. 1903.
- CALTHA leptosepala, host to *Puccinia gemella* Diet. et Holw. n. sp. *Monogr. Uredin.* 1:541. 15 May 1903.
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NOTES FROM MYCOLOGICAL LITERATURE. VI.

W. A. KELLERMAN.

PROFESSOR J. H. SCHAFFNER FURNISHES ANOTHER INSTALLMENT of his Laboratory Outlines for the elementary study of Plant Structures and Functions from the standpoint of evolution, namely, the Higher Fungi and Lichens, in the Journal of Applied Microscopy, 6:2275-7, April 1903. The subjects are: *Saccharomyces cerevisiae* Meyen, Beer and Bread Yeast; *Morchella esculenta* (L.) Pers., Morel; *Aspergillus herbariorum* (Wigg.) Fisch., Common Green Mould; *Uncinula salicis* (DC.) Wint.; and *Ustilago maydis* (DC.) Tul.

NOTES ON SOME OF THE FUNGOUS DISEASES affecting Horticultural Crops, to-wit, Black Knot (*Plowrightia morbosa* Sch.), The Crown Gall (*Dendrophagus globosus*), Peach Yellows, and Peach and Plum Rosette, are given by R. S. Mackintosh in Alabama Agricultural Experiment Station Bulletin No. 124:93-101, May 1903.

IN THE ACTA PRO FAUNA ET FLORA FENNICA (22:13 et seq., 1902) J. Ivar Lindroth in the course of his article on Die Umbelliferen-Uredineen, points out that the American Rust on *Osmorrhiza brevistylis* DC., *O. longistylis* DC., *O. nuda* Torr., and *Osmorrhiza* sp. ought to be listed as *Puccinia osmorrhizae* (Peck) Lindroth, with synonymy as follows: *Aecidium osmorrhizae* Peck, *Puccinia myrrhis* Peck 25th Rep., *P. chaerophylli* Tranzsch. F. Ross. 217, *P. bupleuri* Berk. and *P. pimpinellae* Aut. p. p. This Rust is different from *Puccinia chaerophylli* Purt. *Puccinia myrrhis* Schw. occurs on *Chaerophyllum procumbens* Crantz. In his enumeration no North American species occur as hosts for *Puccinia pimpinellae* (Strauss) Mart., or for *Puccinia chaerophylli* Purt.

BEITRAEGE ZUR BIOLOGIE DER UREDINEEN, VON W. BANDI, in Hedwigia, 42:118-128, 42:129-152, 9 Mai 1903 and 4 Juli 1903, details culture experiments with *Phragmidium subcorticium* (Schrank) Winter, and *Puccinia caricis-montanae* Ed. Fischer. Die Untersuchungen sollen ein Beitrag sein zu der Frage der Spezialisierung bei den Rostpilzen.

THE CONCLUDING PORTION OF TYCHO VESTERGREN'S ZUR PILZFLORA DER INSEL OESEL is given in Hedwigia, Heft 3, 1903. A large number of species is listed accompanied with critical notes; several new species are described.

SEVEN NEW SOUTH AMERICAN SPECIES OF FUNGI IMPERFECTI are described by H. et P. Sydow in Beiblatt zur Hedwigia, 42:(105)-(106), Mai 1903, under the title Beitrag zur Pilzflora Süd-Amerikas.

EINIGE NEUE JAPANISCHE UREDINEEN IV, Beiblatt zur Hedwigia, 42:(107)-(108), Mai 1903, contains the descriptions of eight new species by P. Hennings.

P. HENNINGS PUBLISHES EINE KURZE AUFZÄHLUNG of species received from the museum of Frau Gräfin Scheremetjeff, under the title Beitrag zur Pilzflora des Gouvernements Moskau, in Beiblatt zur Hedwigia, 42:(108)-(118), Mai 1903. Diagnoses of several new species are given.

A VERY CONVENIENT, MUCH CONDENSED OUTLINE, by W. A. Orton, of the Plant Diseases in the United States in 1902, is given on pp. 714-719 of the Yearbook of the United States Department of Agriculture, 1902 (published 1903). The fungi

causing the diseases and their prevalence are indicated, grouped according to the hosts.

GEORGE T. MOORE GIVES A VALUABLE ARTICLE on Bacteria and the Nitrogen Problem, in the Yearbook of the United States Department of Agriculture 1902:333-42, illustrated with 6 full-page plates. Investigation of the nitrogen-fixing bacteria has been carried on at the Bureau of Plant Industry in the laboratory of plant Physiology. It has been found "that by gradually reducing the amount of Nitrogen in the culture medium it is possible to greatly increase the nitrogen-fixing power of the germs, and that by proper manipulation their activity may be increased from five to ten times that which usually occurs in nature."

IN MALPHIGIA, ANNO XVII, FASC. I-III an interesting article by Pietro Voglino is entitled Sullo sviluppo della *Ramularia aequivoca* (Ces.) Sacc. The fourth item in his Conclusione is as follows: *La Ramularia aequivoca* (Ces.) Sacc., é molto probabilmente lo stato conidiale della *Stigmatea ranunculi* Fries.

A PROVISIONAL LIST OF THE UREDINEAE OF BOURBON COUNTY, KANSAS, by A. O. Garrett, is published in Vol. XVIII (pp. 147-150) of the Transactions of the Academy of Science, 1903. Hosts and dates of collecting are given after each of the listed species. The following are included: 9 species of *Aecidium*, 3 *Coleosporium*, 2 *Gymnosporangium*, 1 *Melampsora*, 20 *Puccinia*, 1 *Pucciniastrum*, 2 *Uredo*, and 8 *Uromyces*. Description is given of the *Aecidia* of *Puccinia nigrescens* Peck, which "has not been previously reported in America." Underground sori of teleutospores of *Puccinia podophylli* Schw. were found May 10th and 27th.

BULLETIN DE LA SOCIETE MYCOLOGIQUE DE FRANCE, TOME XIX, 2e FASCICULE, issued April 30, 1903, contains the following articles: Pavillard et Lagarde, Myxomycètes des environs de Montpellier; P. Vuillemin, Importance taxinomique de l'appareil zygosporé des Mucorinées; P. Vuillemin, Le genre *Tieghemella* et la serie des Absidiées; G. Delacroix, Travaux de la Station de pathologie végétale; M. Molliard, Observations sur le *Cyphella ampla* Lév., obtenu en culture pure; Marin Molliard, Sur une condition que favorise la production des périthèces chez les *Ascobolus*; G. Bainier, Sur quelque espèces de Mucorinées nouvelles ou peu connues; L. Magnin, Un cas d'empoisonnement par l'*Amanita muscaria*.

THE ARTICLES IN BULLETIN TRIMESTRIEL DE LA SOCIETE MYCOLOGIQUE de France, Tome XIX, 3e Fascicule, are: E. Boudier, Quelque Ascomycètes nouveaux du Jura; Costantin et Lucet, Sur un *Rhizopus* pathogène; F. Guéguen, Recherches morphologiques et biologiques sur quelques *Stysanus*; N. Patouillard, Additions au Catalogue des Champignons de la Tu-

nisie; E. Boulanger, Sur la culture de la Truffe à partir de la spore; L. Matruchot, Sur la culture artificielle de la Truffe; M. Barbier, Liste annotée d' Hyménomycètes des environs de Dijon; A. Maublanc, Sur quelques espèces nouvelles de champignons inférieurs; M. Herrera, Sur le rôle prédominant des substances minérales dans les phénomènes biologiques.

DEANE B. SWINGLE GIVES HIS STUDIES IN SPORE FORMATION in the sporangia of *Rhizopus nigricans* and in *Phycomyces nitens* in Bulletin 37 (pp. 1-40) U. S. Department of Agriculture, Bureau of Plant Industry. The article is illustrated by six lithographic plates. After a resumé of work previously done on the Mucorineae by Corda (1838), van Tieghen (1873-6), Strasburger (1880), Büggen (1882), Léger (1896), Thaxter (1897), Harper (1899), and Hans Bachmann (1899), touching the life history and gross anatomy of nearly all the species — there being "in regard to the cytological details the widest difference of opinion, chiefly owing to the fact that only a few forms have been studied with the aid of the most recent methods" — Mr. Swingle details his work on the two species, followed by eight or nine pages of general considerations and summary, also a page of Index to Literature. It is interesting to note that in the four genera of Mucorineae most carefully studied no two are alike in respect to the processes of spore formation.

ANNALES MYCOLOGICI, VOL. I, No. 3, MAI 1903, contains the following articles: Guilliermond, Contribution à l'étude de l'épithème des Ascomycètes et recherches sur les corpuscules métachromatiques des Champignons; Patouillard, Note sur trois Champignons des Antilles; Maire et Saccardo, Notes mycologiques; Saccardo, Una malattia crittogamica nelle frutta del mandarino (*Alternaria tenuis*, forma *chalaroides* Sacc.); Traverso, Diagnoses Micromycetum novorum italicorum; Sydow, Beitrag zur Pilzflora des Litoral-Gebietes und Istriens; Bubák, Zwei neue, Monocotylen bewohnende Pilze; Dietel, Bemerkungen über die Uredineen-Gattung *Zaghouania* Pat.

DASS EIN VERHAELTNISMAESSIG GROSSER PROZENTSATZ DER PILZE doppelt und mehrfach, oft in ganz verschiedenen Gattungen beschrieben ist, leidet keinen Zweifel, is the keynote to an article by Franz v. Höhnelt, in Beiblatt zur Hedwigia, 42:(185)-(188), July 4, 1903, entitled Mykologische Irrtumsquellen. It is really a second communication on this subject; — and there as here many cases are enumerated and corrected.

REMARQUES TAXONOMIQUES ET CYTOLOGIQUES SUR le *Botryosporium pulchellum* R. Maire (*Cephalosporium dendroides* Ell. & Kell.) by René Maire, published in Annales Mycologici (1:335-340, July 1903), alludes to the articles published in the Journal of Mycology concerning this fungus. As to the syste-

matic aspect it may be said that the name accepted by us (i. e. Corda's name) is rejected by Mons. Maire, his statement being: "En résumé, à notre avis, les dénominations antérieures à la découverte de la *tête condifère*, c'est à dire à Costantin, doivent être reléguées dans le chaos des anciens noms douteux et inapplicables." As two species are involved his list is as follows: 1. *Botryosporium pyramidale* Cost.; 2. *Botryosporium longibrachiatum* (Oud.) Maire, (*Botrytis longibrachiata* Oud., *B. [Polyactis] doryphora* Pound & Clem., *B. pulchellum* R. Maire, *Cephalosporium dendroides* Ell. & Kellerm.)

BACTERIA IN MODERN ECONOMIC AGRICULTURE is the title of an instructive article by Professor Albert Schneider in the August number of the Popular Science Monthly (66:333-343). The Rhizobia, or Nodule Bacteria, "assimilate free nitrogen in artificial culture media or when not symbiotically associated with leguminous plants." Therefore it would seem probable that Rhizobia of leguminous plants might be modified by culture so as to induce them to grow on the roots of other plants, say corn, wheat, rye, barley, etc. Experimental results are not yet conclusive, yet "the indications are that they will finally prove successful." Then there may be other organisms or soil bacteria, not found in leguminous root nodules, that can fix free nitrogen, and which may be especially adapted to gramineous plants. "It would appear that the *Bacillus ellenbachiensis* of Caron is such an organism. . . . It would be especially advantageous, because, in contradistinction to Rhizobia, it forms spores. Spore-bearing cultures would be desirable because they would keep better and longer."

THE FIFTH INSTALLMENT OF THE POLYPORACEAE OF NORTH AMERICA, by William Alphonso Murrill, is published in the Bulletin of the Torrey Botanical Club (30:423-434, Aug. 1903). The genera *Cryptoporus*, *Piptoporus*, *Scutiger*, and *Porodiscus* are included, the species being those found chiefly under the genus *Polyporus* in Saccardo. Those treated formerly (groups of the genus *Fomes*, as this term is generally used) are for the most part perennial with large stratified sporophores. The plants included in this paper are annual and their fruit-bodies are less conspicuous, their mycelium being usually comparatively limited in extent. They are mostly terrestrial, somewhat fleshy and allied to the Boletaceae. Full synonymy, notes and distribution are given. One new genus is proposed, also three new species; ten new names (or new combinations) are given.

BRUCE FINK DISCUSSES SOME ECOLOGIC FACTORS relative to the distribution of Lichens, in Some Common Types of Lichen Formations, Bulletin of the Torrey Botanical Club, 30:412-418, July 1903. He gives a list of the Lichen species

most commonly occurring in the two formations, namely, The Lecanora Formations of Exposed Boulders, and The Lecanora calcarea contorta Formations of Exposed Horizontal Limestone Surfaces (or of Limy Pebbles).

BULLETIN NO. 44, BUREAU OF PLANT INDUSTRY, U. S. Department of Agriculture, (issued July 18, 1903) is devoted to the subject of Bitter Rot of Apples, the authors being Hermann von Schrenk and Perley Spaulding. It is illustrated with twelve plates. It is an exhaustive treatise giving an historical account, distribution, description of the rot, the bitter-rot fungus, the canker stage, remedial measures, and index to literature. The Bitter Rot (or Ripe Rot) of Apples was, according to Curtis's catalogue, in the United States before 1867, but it was not until 1874 that the fungus was described by Berkeley. Names in common use as *Gloeosporium fructigenum*, *Gl. rufomaculans*, and *Gnomoniopsis fructigena*, have been relegated to synonymy by the use of a new generic name, *Glomerella*, proposed by the authors — not however published here for the first time as might be supposed: see *Science*, N. S. 17:751. 8 May 1903.

A NOTICE OF WORK DONE ON THE WHITE ROT OF THE GRAPE (*Coniothyrium diplodiella*) by Gy. de Istvánffi is given in the *Botanical Gazette* (p. 147-8, Aug. 1903), being a review of that author's *Etudes sur le rot livide de la vigne*, published by the Hungarian Minister of Agriculture in 1902. A minute description of the development of the disease is given, including the reactions induced in the host plant by the fungus. The most interesting part is that which deals with the effects of various toxic substances on the fungus.

B. O. LONGYEAR GIVES Some Suggestions for the Beginner in Collecting and Studying the Fleshy Fungi, in the June No. of the *Journal of Applied Microscopy and Laboratory Methods* (6:2369-73, 1903).

COLLECTING AND PRESERVING LICHENS is the title of a two-page article by E. E. Bogue, for the benefit of beginners, in the June No. of the *Journal of Applied Microscopy and Laboratory Methods* (6:2373-4, 1903).

THE THIRD INSTALLMENT OF BACTERIOLOGY FOR HIGH SCHOOLS by W. D. Frost and E. G. Hastings is published in the June No. of the *Journal of Applied Microscopy and Laboratory Methods* (6:2383-5, 1903). This deals with the microscopical examination of Bacteria.

PROFESSOR JOHN H. SCHAFFNER CONTINUES HIS LABORATORY OUTLINES for the Elementary Study of Plant Structures and Functions from the Standpoint of Evolution in the June No. of the *Journal of Applied Microscopy and Laboratory Methods*

(6:2387-8, 1903). To represent the Higher Fungi [continued] and Lichens he uses *Bovista plumbea*, *Parmelia caperata*, *Sticta amplissima* and *Endocarpon miniatum*.

THE GENUS *FOMES* is the 3d installment of the *Polyporaceae* of North America, by William Alphonso Murrill, *Bulletin of the Torrey Botanical Club*, 30:225-232, April 1903. *Fomes*, usually credited to Fries, was used by him for a subdivision of the genus *Polyporus*. Gillet (1878) raised *Fomes* to generic rank. The author gives a "synopsis" (dichotomal key) to the 12 species — two of which are new species, and three others receive new names. Full synonymy and distribution, also notes are given for each of the species.

OOGENESIS IN *SAPROLEGNIA* BY BRADLEY MOORE DAVIS, *Contributions from the Hull Botanical Laboratory*, XLVI, *Botanical Gazette*, 35:233-249, 320-349, plates IX and X, April and May 1903, is concerned chiefly with the events of oogenesis and a comparison of this process with the development of zoospores. The paper concludes with *Theoretical Considerations*, which deals with a number of topics suggested by the study in relation to recent investigations upon *Phycomycetes* and *Ascomycetes*, followed by an alphabetical list of the authors of the literature cited.

A STUDY OF THE FOOD VALUE OF SOME OF THE EDIBLE FUNGI of Ames, Iowa, by J. B. Weems and Alice W. Hess, is given in the *Proc. 23d An. Meeting Soc. Prom. Agr. Sci.* 1902. (pp. 165-172.) During the summer of 1901 the authors collected and analyzed *Coprinus atramentarius*, *C. micaceus*, *Hirneola auricula-judæ*, *Hydnum coralloides*, *Morchella esculenta*, *Lycoperdon giganteum*, *L. gemmatum*, *Pleurotus sapidus*, and *P. ulmarius*. Tables are compiled also by the analysts. This statement is made: Though the full value of the mushroom is materially lowered when the deduction is made for the non-digestible protein, and lowered more than the full value of the vegetables when the undigestible fat and carbohydrates as well as the protein is deducted, yet the mushroom would fall within the rank of the fresh vegetables if the whole of the carbohydrates and fats were digestible.

HOLLIS WEBSTER GIVES AN INTERESTING DESCRIPTION of the peculiar *Clitocybe trullisata* Ellis (*Boston Mycological Club, Bulletin* No. 20, June 1903) which may be found in "any old sandy field" in Eastern Massachusetts, for example about Plymouth, on Cape Cod, the dunes of Ipswich or the farther inland sandy plains. The fungus looks as if it hadn't much of a stem. There is a stem, long and surprisingly stout and swollen, but it is out of sight, deeply buried in the sand. This stem is of a metallic violet color when the sand is rubbed off; the interior of the broken stem shows same color. A dark violaceous tint appears in the

gills though the spores are white. A full-page plate in the Bulletin gives a good idea of the appearance of this *Clitocybe*.

A LIST OF SPECIES OF FUNGI, Hymenomycetes, Gastromycetes, and Ascomycetes, by Jennie F. Conant, is given in a four-page Bulletin (No. 19) of the Boston Mycological Club, issued Feb. 5, 1903, which represents the collection by members, exhibited at the Horticultural Hall, Boston, during the year 1902. The interesting list is too long to count — say over three hundred species.

A ROSETTE DISEASE OF POTATOES, attributed to the sterile fungus *Rhizoctonia*, is the title of Bulletin 139, Ohio Agr. Exp. Sta., April 1903. Perhaps guilty but not proved would express the attitude of mind of the author of the Bulletin — at least he says "The sterile fungus, *Rhizoctonia*, is indicated as the cause in the instances stated, by the constant presence and a high degree of probability attaches to this indication." A list of some articles relating to diseases of the Potato attributed to *Rhizoctonia* includes twenty items chronologically, arranged the dates being 1858-9 to 1902.

CONTRIBUTIONS FROM THE CRYPTOGAMIC LABORATORY OF HARVARD UNIVERSITY, LV, by R. Thaxter, consists of Mycological Notes, 1-2, namely, A New England *Choanephora* (described by Berkeley in 1875 under the name of *Rhopalomyces cucurbitarum*), and Notes on *Monoblepharis*. Objection is entered against dividing the latter into genera (or even subgenera) which Lagerheim has proposed. A Key is appended for the six species of this alga-like genus *Monoblepharis*. This No. of the contributions appears in *Rhodora*, 5: 97-108. April 1903.

A MINNESOTA SPECIES OF TUBER, namely *Tuber lyoni*, is reported by Fred K. Butters, in the June No. (1903) of the Botanical Gazette (pp. 427-31). The specimens were found March 11, in the leaf-mould about the base of small group of Bass-wood trees, in a mature condition, doubtless formed late in the previous autumn.

THE MORE IMPORTANT DISEASES OF FORAGE PLANTS as given by David Griffiths in Forage Conditions and Problems of Eastern Washington and Adjacent Regions, U. S. Department of Agriculture, Bureau of Plant Industry, No. 38 (pp. 43-4), are caused by the following Smuts: *Ustilago hypodites*, *U. scolochoa*, *U. bromivora*, *U. striæformis*, and *Tilletia fusca*. This class of parasitic fungi injures more (the author states) than one would suppose, the development of native economic plants. Reference is made in one case to meadows of the valuable Sprangle-top (*Scolochloa festucacea*), "in which one-half to two-thirds of the vegetation consisted of this grass, and one-half of the plants were smutted."

OUTLINE OF THE HISTORY OF LEGUMINOUS ROOT NODULES AND RHIZOBIA with Titles of Literature concerning the Fixation of Free Nitrogen by Plants III, is the title of a short article by Albert Schneider in the Minnesota Botanical Studies, Third Series, Part II, July 3, 1903 (pp. 133-9). The first installment of titles (by Dr. D. T. McDougal) was published in this Series in 1894, the second (by Prof. Albert Schneider) in 1897. These and the present list include 780 titles. In a history to be prepared the following outline will be followed: First Period: Initial Study of Leguminous Root Tubercles — from Clos (1848) to Lawes and Gilbert (1860); Second Period: Collateral Investigation which led to the Discovery of the True Nature of Root Tubercles — from Lawes and Gilbert (1860) to Frank (1879); Third Period: The Scientific Investigation of Leguminous Root Tubercles and Rhizobia — from Frank (1879) to Schneider (1893).

LICHENS OF THE NORTHERN BOUNDARY is the Title of the VIIth paper of Contributions to a Knowledge of the Lichens of Minnesota, by Bruce Fink, published in Part II (pp. 167-244), Minnesota Botanical Studies, July 3, 1903. A long list of Lichen Formations is discussed, followed by an enumeration of 310 species and varieties with dates and habitats.

PROF. ALBERT SCHNEIDER PUBLISHES HIS THIRD CONTRIBUTION to the Biology of Rhizobia under the title of Notes on the Winter and Spring Condition of Rhizobia and Root Tubercles, Botanical Gazette, 36:64-7, July 1903. He says that most of the Rhizobia are killed during the winter months; the tubercles of perennial herbaceous legumes attain their full growth during the early part of the first season, mostly die and decay at the close of the second season.

FLIES AS CARRIERS OF BACTERIA, work done by two students in the Eastern Illinois State Normal School, is published and illustrated in School Science, 3:16-20, April 1903; the same is reproduced in Jour. Appl. Micr. 6:2402-4, July 1903. "The work is of value, not only on account of its scientific interest, but also because it points the way to a new field of effort opened to secondary students."

A GALL UPON A MUSHROOM, caused by dipterous larvae of Mycetophilidae, found at Ithaca, N. Y., Sept. 12, 1892 — the plants being two specimens of *Omphalia campanella* — illustrated by several figures, and described in detail, by Charles Thom, is published in the Botanical Gazette, 36:223-5, September 1903.

THE BOSTON MYCOLOGICAL CLUB has issued interesting Bulletins from time to time. Nos. 15 and 16, (8 pp.), June 1901 are devoted to the genus *Coprinus*, author Edwin A. Daniels. Descriptions are given of all the species so far reported for the

United States, Masee's Classification being followed. Nos. 17 and 18, (8 pp.), December 1901, are searching reviews of several books on Mushrooms, by Hollis Webster.

W. C. COKER OFFERS IN THE JOURNAL OF APPLIED MICROSCOPY, 6:2411-2, July 1903, some suggestions on Algae and Fungi for class work. Rhizopus is not always satisfactory for showing sexual reproduction and Sporodinia grandis was found to be a good substitute.

BACTERIOLOGY FOR HIGH SCHOOLS, IV. Microscopical Examination (continued) is the subject of a short illustrated article by W. D. Frost and E. G. Hastings, Journal of Applied Microscopy, 6:2426-8, July 1903.

THE MYCOLOGICAL ARTICLES IN THE REPORT OF THE BOTANIST, 23d Annual Report of the New Jersey State Agricultural Experiment Station, for the year 1902 (pp. 337-422, published in 1903), are as follows: Notes upon Club-root, The Mildew of Lima Bean, The Asparagus Rust, Fungi as related to Weather, Notes upon some Rusts and Mildews at Wernersville, Pa., and Fungus Enemies of Plants in Nova Scotia.

THE BLACK ROT OF CABBAGE caused by the bacterium Pseudomonas campestris (Pam.) Smith, can not be prevented by the removal of the affected leaves, is the conclusion reached after four years of practical field tests by F. C. Stewart and H. A. Harding, whose work is reported in full in the New York Agricultural Experiment Station Bulletin 232:43-65, Pl. I-II, April 1903.

MRS. CAROLYN W. HARRIS LISTS THE LICHENS belonging to Sticta and to Nephroma and Solorina, with popular descriptions or notes and several figures, in the Bryologist, 6:55-8, and 76-9, July and Sept. 1903.

BULLETIN 117, KANSAS EXPERIMENT STATION contains an account of Bacteria of the Soil with results of cultures carried on through a series of years by N. S. Mayo and A. T. Kinsley. They call attention to the high bacterial content of soil containing Buffalo Grass, and to the marked decrease in the bacterial content in the western part of the state.

THE FOURTH NUMBER OF THE ANNALES MYCOLOGICI (1:297-390, July 1903) contains the following articles: Traverso, Primo elenco die Micromiceti di Valtellina; Sydow, Neue und kritische Uredineen; Maire, Remarques taxonomiques et cytologiques sur le Botryosporium pulchellum R. Maire (Cephalosporium dendroides Ell. & Kell.); Heinze, Einiges, über Säurebildung durch Pilze, insbesondere auch über Essigsäure- und Oxalsäurebildung durch Aspergillus niger; Zahlbruckner, Neue Flechten.

IN AN ARTICLE PUBLISHED IN HEDWIGIA (Beiblatt, 42: (179)-(181), Juli 1903,) it is stated by P. Dietel that a *Phragmidium* on *Potentilla*, usually referred to either *Ph. potentillae* (Pers.) Karst., or *Ph. obtusum* (Kze. & Schmidt) Wint., is a new species and it is described under the name of *Ph. potentillae-canadensis* Diet. The same author also refers the *Coleosporium* on *Veronia noveboracensis*, heretofore called *C. vernoniae* B. & C., to the genus *Stichopsora*; and hence records it as *Stichopsora vernoniae* (B. & C.) Diet.; likewise our *Coleosporium solidaginis* is given as *Stichopsora solidaginis* (Schw.) Diet.

A BEAUTIFUL PLUTEOLUS, IS NOTED BY H. WEBSTER in *Rhodora*, 5:197-9, Aug. 1903. The delicate *Pluteolus expansus* Peck was observed at Alstead, N. H., late in July and a careful study justifies the place of this plant in classification now occupied — at first having been placed in the genus *Galera*. Mr. Webster points out that the substance of the stipe and pileus is plainly not homogeneous. He adds: "The viscid, greenish yellow caps, elevated on long slender stems, white tinged with yellow, announced a novelty at first sight."

HYPOCHNUS SP., ANOTHER APPLE ROT FOLLOWING SCAB, is reported at some length and illustrated by four plates in the New York Agricultural Experiment Station Bulletin No. 255, July 1903. This is similar in appearance to *Cephalothecium roseum* which the same author, H. J. Eustace, showed also to be parasitic. It seems to be an undescribed species — a wound parasite and can not grow through sound epidermis.

THE SECTION OF LEPIDEI is presented in the dichotomal key, by F. S. Earle, of the North American species of *Lentinus* in *Torreyia*, 3:58-9, April 1903. It contains thirty-nine species. Other keys in the same periodical by the same author, published so far this year, are species (26) of *Panus* (pp. 86-87), species (10) of *Pluteolus* (pp. 124-5), of *Galera* (pp. 134-6) thirty-eight species.

ARTICLES ON BACTERIOLOGY FOR HIGH SCHOOLS, plain directions for work, illustrated with figures, have been published this year in the *Journal of Applied Microscopy* by W. D. Frost and E. G. Hastings, on pp. 2270-2273 (April), 2383-5 (June), and 2426-8 (July).

A NEW NAME IS AGAIN PROPOSED FOR THE BITTER-ROT FUNGUS by Herman von Schrenk and Perley Spaulding, — *Science*, N. S., 17:749-51, 8 May 1903. The name is *Glomerella rufo-maculans* (Berk.) Spaulding & von Schrenk. The genus *Glomerella* von Schrenk & Spaulding n. n. replaces *Gnomoniopsis* Stoneman. *Septoria rufo-maculans* on Grapes was described by Berkeley in 1854. He described *Gloeosporium fructigenum* on apples in 1856. These two are the same. In 1898 Clinton, finding

the perfect stage of the fungus, placed it in Miss Stoneman's genus *Gnomoniopsis*; the latter being invalidated by preoccupation, the name as above is now the appropriate one.

WILLIAM ALPHONSO MURRILL CONTINUES his studies of the Polyporaceae of North America, giving the fourth installment, namely, the genus *Elfvingia*, in the May. No. of the Bulletin of the Torrey Botanical Club (30:296-301, 1903). Now we have *Elfvingia fomentaria* for Fries' *Polyporus reniformis*; *Elfvingia megaloma* for what has usually been called *Polyporus applanatus* Pers. by American botanists, the commonest species of Shelf-Fungus, though it is *Polyporus leucophaeus* Mont. as now agreed by all mycologists.

FUNGI ON OLD LOGS AND STUMPS is the title of a short popular article in the June (1903) No. of the Plant World (6:139) by C. L. Shear. A beautiful plate of a *Hydnum* and a *Polyporus* is given.

THE MYCOLOGICAL ARTICLES IN HEDWIGIA, Heft 2 (Band XLII, 28 März 1903), are as follows:—Zur Pilzflora der Insel Oesel, Tycho Vestergren; *Fungi australiensis*, P. Hennings; Ueber die *Uromyces*-Arten auf Lupinen, P. Dietel; Beitrag zur Kenntniss einiger *Phycomyceten*, Fr. Bubák.

THE MYCOLOGICAL ARTICLES IN HEDWIGIA, Heft, 3 (Band XLII, 9 Mai 1903), are as follows:—Zur Pilzflora der Insel Oesel (Schluss), Tycho Vestergren; Beiträge zur Biologie der Uredineen, W. Bandi; Beitrag zur Pilze Süd-Amerikas, H. et P. Sydow; Einige neue japanische Uredineen IV, P. Hennings; Beitrag zur Pilzflora des Gouvernements Moskau, P. Hennings.

THE MYCOLOGICAL ARTICLES IN HEDWIGIA, Heft 4 (Band XLII, 4 Juli 1903), are as follows:—Beiträge zur Biologie der Uredineen (Schluss), W. Bandi; Sphæroideen aus Thüringen, A. Diedicke; Ascomyceten-studien I, H. Rehm; Ueber einige Ramularien auf Doldengewächsen, Franz v. Höhnelt; Bemerkungen über einige nordamerikanische Uredineen, P. Dietel; Einige deutsche Dung bewohnende Ascomyceten, P. Hennings; Mykologische Irrtumsquellen, Franz v. Höhnelt; and Zwei neue Früchte bewohnende Uredineen, P. Hennings.

FASCICULUS III OF SYDOW'S MONOGRAPHIA UREDINEARUM was published May 15, 1903. The pp. are 385-592; the list of species 596-879. The host plants are the families Umbelliferae to Moraceae. Fifteen new species (or varieties) are described, of which two belong to North America, namely, *Puccinia euphorbia intumescens* Syd. nov. var., on *Euphorbia calyculata* (Mexico), and *Puccinia gemella* Diet. & Holw. n. sp. (in Litt.) on *Caltha leptosepala* (Tacoma, Wash.). The new name *Puccinia solitaria* Syd. replaces *Puccinia simplex* Peck (nec Koern), and

claytoniata (i. e. *Puccinia claytoniata* [Schw.] Syd.) is restored to the Rust that occurs on *Claytonia*; the common designation for this has been *Puccinia mariæ-wilsoni* Peck.

H. DIEDICKE CALLS ATTENTION TO THE FACT that Die Aecidien der *Puccinia stipæ* (Op.) Hora (*Annales Mycologici*, 1: 341-3, July 1903), of which the name of Arthur appears as the author in Bulletin of the Iowa Agricultural College 160, 1884, and in the Bulletin from the Laboratories of Natural History, State University of Iowa (1898, p. 389), have been obtained by cultures on species of *Thymus*. The author also details his own experiments showing that the æcidial stage of this Rust also inhabits *Salvia silvestris*.

THE EDITOR OF *ANNALES MYCOLOGICI* has decided to publish also lichenological literature, and in the July No. (pp. 354-361) prints the Latin diagnoses of ten new species of Lichens by A. Zahlbruckner. One new genus is proposed, namely, *Pseudoheppia* A. Zahlbr.

IN THE ARTICLE NEUE UND KRITISCHE UREDINEEN by H. & P. Sydow, *Annales Mycologici*, 1:324-334 July 1903, nine of the species are American. It is interesting to note that one of them is on leaves of a host, namely, *Aecidium aikenii* on *Thalictrum purpurascens*, that harbors also another known fungus, i. e. *Aecidium thalictri-flavi*. The authors point out that Tracy and Earle's *Puccinia notabilis* is a synonym of *Puccinia splendens* Vize.

ZUR ENTWICKELUNGSGESCHICHTE, MORPHOLOGIE UND SYSTEMATIK DER FLECHTEN von Birger Nilson, is the title of a thorough paper published in the *Botaniska Notiser*, 1903:1-33.

IN THE REVISTA AGRONOMICA (Lisboa) for June 1903, J. Bresadola describes a new genus (with one species) of Hymenogastreae, namely, "*Torrendia* Bres. n. gen.—etym. a cl. Camillo Torrend Societatis Jesu floræ mycologicæ lusitanæ scrutatore sollertissimo."

DER CHRYSANTHEMUM-ROST, II, VON DR. ERNST JACKY, published in *Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten*, II Abteilung, 10:369-381, 1903, deals with the question of identity of the Hemi-*Puccinia* that occurs on *Chrysanthemum chinense* in Japan, with that found in Europe and America (on *Chrysanthemum indicum*). Culture experiments are detailed, and the conclusion reached that they are one and the same species. The name and synonymy are as follows: *Puccinia chrysanthemi* Roze; syn. *P. chrysanthemi chinensis* P. Henn., *P. pyrethri* Rabh. p. p., Sydow (*Monogr. Ured.* 1:45), *Uredo chrysanthemi* Roze, and *P. hieracii* Mart. p. p.

THE RELATIONS OF INSECTS TO FUNGI are quite fully outlined under the above title, by Perley Spaulding in the *Plant World*, 6:182-4, August 1903. Many Insects are appropriated by fungi as a base upon which to grow. Some of the cases cited are cicadas, ants, locusts, chinch bugs, flies, bees, wasps, beetles, moths, and butterflies. Of plant diseases which are known to be carried by insects the author mentions Ergot, Smuts, Brown-rot, Bitter-rot, some of the Rusts, and a few of the bacterial diseases. The Ambrosia fungi are used as food by some wood-boring beetles. Honey bees have been caught taking the spores of the Bramble Rust.

THE BOTANICAL GAZETTE PUBLISHES A BRIEF REVIEW of the investigations of J. Brezezinski (*Bull. Acad. Sci. de Cracovie*, 1903:95-143. pls. 2-8.) who says the canker disease of trees, long attributed to *Nectria ditissima*, is never caused by this fungus, which in the opinion of the author is a mere saprophyte on dead portions of the bark. The canker wound is therefore one of the external manifestations of the disease (Bacteriosis) from which the tree is suffering. The author regards certain Bacteria which he found growing in the wood as the true cause of the injury — three species being described, namely, *Bacterium mali* on apple, *B. pyri* on pear, and *B. coryli* on Hazel.

A SHORT NOTE IN THE BULLETIN OF THE BOTANICAL DEPARTMENT, Trinidad, No. 38 (p. 551, note 523), 1903, calls attention to the occurrence in that country, recently detected, of the Cacao Disease (Witches' Broom), the Surinam disease known as *Exoascus theobroma*, Ritzema Bos. In the previous No. (38; p. 507, note 496) it is stated that *Cordyceps ravenelii* B. et C. had been found on Cacao estates in Trinidad.

THE STATE OF ALABAMA PASSED A LAW, March 5, 1903, designed (among other things) to exclude Crop Pests of all kinds from that State. We note that the following Fungous Diseases are enumerated by the State Board of Horticulture (the members of which are to carry the law into effect), as constituting "infection in trees and plants, the same when occurring in nursery stock to be destroyed:" Black Knot (*Plowrightia morbosa*), Crown Gall (*Dendrophagus globosus*), Peach Yellows, and Peach and Plum Rosette. Other states have laws pertaining to fungous diseases — to which reference will be made later.

CULTURES OF UREDINEAE IN 1902, *Bot. Gaz.* 35: 10-23, Jan. 1903, by Dr. J. C. Arthur, is his third article of a series of reports upon the cultures of Plant Rusts. It is devoted largely to the heteroecious grass and sedge Rusts. With two assistants he was able to do a large amount of valuable work. Forty-three species were used; in no case was success attained where definite clues derived from field observations were lacking. Fourteen

species were tried by the "guessing method" and the failures reported. Twelve species of rusts were successfully grown that have been studied with success before, reported previously by Arthur and others; some additional hosts are given. Successful cultures were made establishing the aecidial and teleutosporic association, heretofore unknown, of seven heteroecious grass and sedge Rusts. These are *Uromyces aristidae* E. & E., aecidium on *Plantago rugelii* Dec.; *Puccinia jamesiana* (Pk.) Arth., aecidium on *Asclepias incarnata* L. and *A. syriaca* L.; *Puccinia impatientis* (Schw.) Arth., aecidium on *Impatiens aurea* Muhl.; *Puccinia subnitens* Diet., aecidium on *Chenopodium album* L.; *Puccinia amphigena* Diet., aecidium on *Smilax herbacea* L. and *S. hispida* Muhl.; *Puccinia simillima* Arth., aecidium on *Anemone canadensis* L.; and *Puccinia caricis-solidaginis* Arth., aecidium on *Solidago canadensis* L., *S. serotina* Ait., *S. caesia* L., *S. ulmifolia* Muhl., and *S. rigida* L.

• A KEY TO THE NORTH AMERICAN SPECIES OF STROPHARIA — 12 in number — is given by Prof. F. S. Earle in *Torrey*, 3:24, Feb. 1903. It is on the dichotomal plan, similar to the keys of several groups prepared by the same author last year, and previously noticed in these Notes.

RASPBERRY CANE BLIGHT AND RASPBERRY YELLOWS is the title of a Bulletin (N. Y. Agr. Exp. Sta. 226:331-366. Dec. 1902) by F. C. Stewart and H. J. Eustace. The Blight caused by *Coniothyrium* (possibly *C. fuckelii* Sacc.) not by a *Phoma* as previously reported by the authors. The cause of the Yellows is undetermined.

HERMANN VON SCHRENK IS THE AUTHOR OF AN EXHAUSTIVE PAPER ON A Disease of the White Ash Caused by *Polyporus fraxinophilus*, U. S. Dept. Agr. Bureau Pl. Industry, Bull. 32: 1-20, Pl. I-V. 28 Feb., 1903. The divisions of the subject are geographical distribution, susceptibility to this disease, method of attack, description of diseased wood, the sporophore, microscopic changes in the wood, growth of the fungus in dead wood, remedies, description of the five plates.

BULLETIN DE LA SOCIÉTÉ MYCOLOGIQUE DE FRANCE, Tome XIX, 1er Fascicule, contains the following original articles: Recherches sur la germination des spores dans le *Saccharomyces ludwigii* Hansen, Pl. I (Guilliermond); Sur le *Sterigmatocystis pseudonigra* (Costantin et Lucet); Espèces critiques d'Agaricénées (Godfrin); Remarques sur la morphologie et le développement de l'*Hilminsporium macrocarpum* Grev., Pl. II et III, (F. Guéguen); Du rôle des Ecoles normales départementales au point de vue de l'enseignement de la Mycologie pratique (J. Costantin).

PROFESSOR M. C. POTTER GIVES IN THE JOURNAL OF THE BOARD OF AGRICULTURE, 9:320, pl. IV, Dec. 1902, an account of a new Potato Disease, occurring in England, caused by *Chrysophlyctis endobiotica* (Chytridineæ) described by Schilberszky in 1896, first found in Hungary. The affected tubers present large convoluted irregular tumour-like swellings. The parasite appears in the diseased tissues as a globular protoplasmic mass (plasmodium), destitute of cell-wall and without any trace of mycelium.

MYCOLOGICAL NOTES, No. 13, (pp. 121-132) C. G. Lloyd, Cincinnati, Ohio, was issued Feb. 1903. The notes are 214-231, devoted to *Catastoma* (3 species), *Mitremyces* (3 species, all figured), and miscellaneous matters.

IN HEDWIGIA, BAND XLII, HEFT 2, pp. 76-96, is published by Tycho Vestergren an article entitled *Zur Pilzflora der Insel Oesel*, which is an enumeration of 290 species of Fungi collected during a six-weeks collecting trip. The groups most largely represented are Uredineæ (79 species), Ustilagineæ (12 species), Peronosporaceæ (22 species), Pyrenomycetes (41 species), Discomycetes (25 species), Sphærøpsideæ (46 species), and Hyphomycetes (48 species). Descriptions of ten new species are given.

BACTERIOLOGY FOR HIGH SCHOOLS, first paper, by W. D. Frost and E. G. Hastings, is published in the *Journal of Applied Microscopy and Laboratory Methods* (6:2205-8, March 1903). The apparatus needed is described and the list of needed chemicals given. Such articles by specialists are to be highly commended. The few better equipped High Schools could well undertake work of this kind — but perhaps putting too much college work into them even should not be encouraged.

ONE SHORT MYCOLOGICAL ARTICLE, namely, *Addenda ad Floram Sardoam* by S. Belli [list and the description of a new species] is given in the *Bulletino della Societa Botanica Italiana* for May and June (No. 5-6, 1903).

THE ARTICLES CONTAINED IN THE SEPTEMBER (1903) NO. OF *ANNALES MYCOLOGICI* are as follows: Höhnelt, *Mycologische Fragmente*; Dietel, *Ueber die Teleutosporenform von Uredo laeviuscula D. et H. und über Melampsora fagi D. et Neg.*; Maire et Saccardo, *Sur un nouveau genre de Phacidiacées*; Vuilleman, *Le Syncephalus adunca sp. nov. et la série des cornutæ*; Saccardo e Traverso, *Contribuzione alla Flora micologica della Sardegna*.

DR. J. J. DAVIS HAS DISTRIBUTED HIS THIRD SUPPLEMENTARY LIST of parasitic Fungi of Wisconsin, as a reprint from the *Transactions of the Wisconsin Academy of Sciences, Arts and Letters*, Vol. XIV, part I. He gives many additional hosts (pp. 84-93) and a list (p. 93 et seq.) of species not recorded in the

previous lists, the latter containing 101 names. A few new species are described, and new combinations proposed. The author referring to such names as *P. "caricis-asteris"*, *P. "caricis-erigerontis"* says: "As it is becoming evident that there are a number of species of Rusts on *Carices* this method of forming specific names from the generic names of both Aecidial and Rust hosts would, if carried out be of much assistance in understanding them." This is a good hint, practical in some cases — but of course the license could not be sanctioned for throwing aside heretofore published names or combinations framed in accord with the accepted usage.

A VERY COMPREHENSIVE TREATISE ON THE FUNGOUS DISEASES OF GRASSES is that by L. H. Pammel and J. B. Weems in the Iowa Geological Survey, Bulletin 1 (pp. 185-292, 1901). Historical and descriptive notes are given of all the common fungi occurring on the native and cultivated grasses. Very many text figures and plates add much to the value of the article, which will prove very useful to beginners and amateurs, and even to professional botanists. The date in the preface shows that it was completed in 1899, but evidently there was considerable delay in publication. Consequently the nomenclature is not always such as the American mycologists use to-day.

DOTT. C. MASSALONGA IN NOTE MICOLOGICHE published in Malphigia, An, XVII, Fasc. IX. pp. 419-423, discusses the following: (1) Sulla causa di un precoce disseccamento delle foglie di *Quercus pubescens* Willd. (with description of *Gloeosporium nervicolum* C. Massal. in litt.); (2) Sull antracnosi delle foglie di *Populus tremula* L.; (3) Di un ifomicete che vive parassita sul tallo di *Candelaria vulgaris* A. Massal. (with description of *Fusarium lechenicolum* C. Massal. in litt.)

TILLETIA IN THE CAPSULE OF BRYOPHYTES is the title of a note by Bradley M. Davis, Botanical Gazette, 36:306-7, Oct. 1903. He calls attention to the fact that the capsules of certain mosses and liverworts are sometimes attacked by fungous parasites that fill these structures with a mass of mycelium, which develops small spores as in the Ustilaginales. In 1892 Nawaschin described such an organism under the name *Tilletia* (?) *sphagni*. The author refers to Sydow's recent *Tilletia* (?) *abscondita*, in the sporophyte of *Anthoceros dichotomus*, and says that "Botanists are probably not aware that the liverwort, *Ricciocarpus nantans*, harbors a parasite which appears to be similar to this *Tilletia* (?) described in the other bryophytes."

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NOTES.

I can not sufficiently thank the mycologists and other botanists, both professional and amateur, for the cordial support given to the Journal of Mycology. This has come to me in the form of unsolicited commendations of the work, subscriptions and contributions. Continued support and assistance will be most gratefully appreciated.

One regret only can possibly be expressed in connection with this matter, namely, that the enlargement of the Journal and more frequent issuance, necessitates an increase in the subscription price; but it is hoped that this may, after all, be quite acceptable to all of the estimable subscribers.

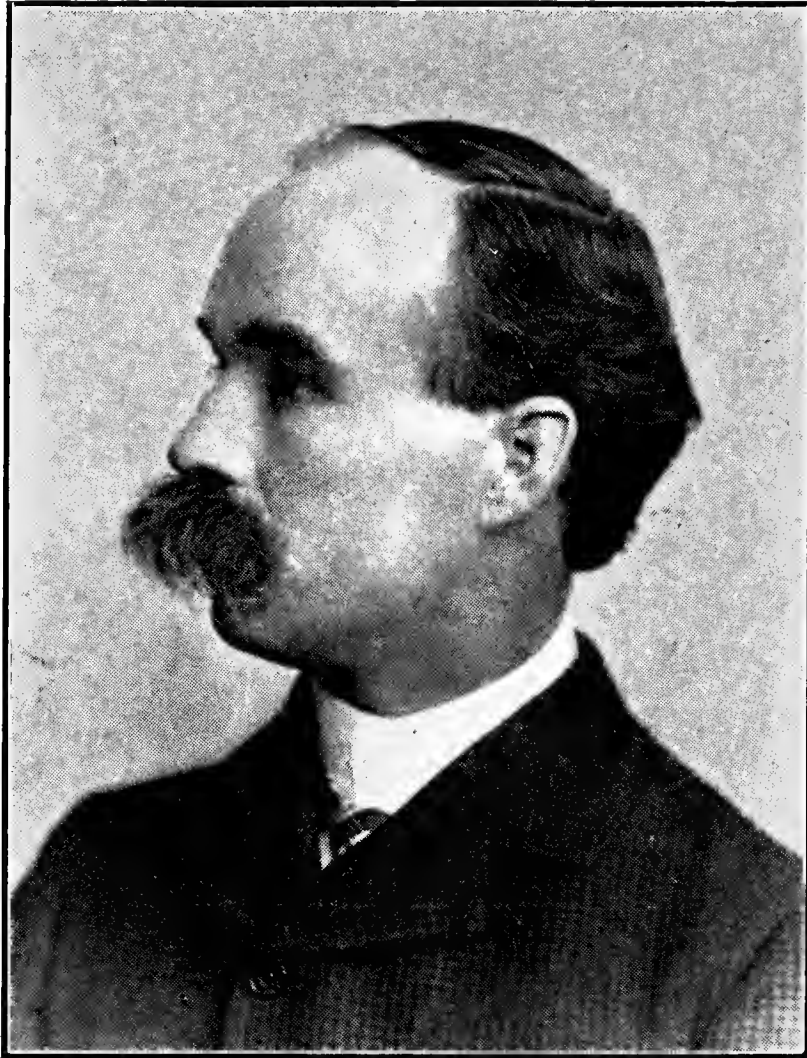
The Journal will be issued the coming year (1904) as a bi-monthly publication; otherwise it will retain the general character exhibited in past numbers. The price will accordingly be two dollars (\$2.00) a year.

It is most unfortunate that Vols. I-VII, inclusive, are entirely exhausted; it is very seldom that second hand copies can be obtained. When available the price is naturally very high.

Therefore the proposition is made (formerly referred to in these pages) to issue a SUMMARY VOLUME of the first seven volumes — the same to contain an exact reprint of all the *original descriptions of fungi* therein contained, and an abstract of the other articles, all with full citation. Will those wishing such a volume — price \$2.00 — kindly notify me at once? If a fair number of orders is received the volume will be issued perhaps in December.

Volumes 8 and 9 (for 1902 and 1903) will hereafter be sold for \$2.00 each, as long as the supply lasts. Earlier volumes can not be furnished; the supply of reprints of some of the articles in those volumes as advertised on page 48 (Vol. 8) is now practically exhausted.

The Reprints of Index to North American Mycology, printed on thin paper on *one side of page only* can be furnished to regular subscribers for the same. The price is 25 cents per copy, payable in advance if desired, or bill will be rendered whenever four Numbers are issued; about three or four will appear annually.



Very sincerely yours
G. W. Atkinson

Journal of Mycology

VOLUME 9—DECEMBER 1903

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A NEW SPECIES OF *BERLESIELLA*.

A. P. MORGAN.

BERLESIELLA *HISPIDA* Morgan sp. nov.

I. *Botryodiplodia*. Stromata cortical, erumpent, elongated, black; perithecia numerous, compact, prominent, rough, black. Sporules obovoid-oblong, at first simple and hyaline, at length brown and 1-septate, 25-30 x 14-17 mic.

II. *Berlesiella*. Stroma thin, cortical, erumpent, black, the perithecia seated upon it and cæspitose or more or less effused. Perithecia large, black, subglobose, simply perforate, hispid with slender, septate, black hairs; asci cylindric, with a short stalk, 150-25 x 18-22 mic., the paraphyses very slender; spores elliptic-oblong, at first hyaline, at length yellow-brown, transversely 4-7-septate, with a few longitudinal septa, usually constricted in the middle, 25-35 x 10-14 mic.

Growing on the bark of *Aesculus glabra*, Preston, O., January, 1897. The perithecia crowded together on the circular or much elongated stroma, which grows in the bark beneath the epidermis, bursting or splitting it at an early stage of its growth.

The most obvious mark of the genus *Berlesiella* appears to be its setulose perithecia; the color of the spores is not different from that in some species of *Cucurbitaria*.

A NEW METHOD OF MOUNTING SUPERFICIAL FUNGI.

HERBERT H. WHETZEL.

In Studying *Sphæropsis malorum* on apple leaves, I found that in its early stages, before pycnidia were formed, well defined brown spots appeared. Although I examined many sections from these brown spots, I failed to discover any mycelium. Material scraped from the surface showed nothing of the mycelial character of the fungus. I had about decided that the spots were not due to a fungus when I found a few immature pycnidia on one of the spots. It then occurred to me to cook a piece of the leaf in a weak solution of Potassium hydrate (KOH) and by macerating the leaf tissues thus to discover the mycelium. I had successfully used this method in studying mycelium distribution in the galls of *Gymnosporangium macropus*. After slowly cooking the leaves for half an hour, I found that the brown coloring of the leaves was bleached out. The epidermis separated as a thin sheet from the other tissues of the leaf. After washing thoroughly in clear water, I examined it under the microscope and found, that, while the leaf tissue was entirely bleached, the brown threads of the fungus still retained their color and showed beautifully.

The same method used on several other fungi growing superficially on leaves, stems and fruits has given in every case excellent results. This method has never before been used, so far as I know, and believing that other persons may find it helpful, I give it in detail as I have worked it out.

1. Carefully peel or slice off a piece of the epidermis on which the fungus is growing. Care should be exercised to take away as little subepidermal tissue as possible.

2. Immerse the slice in a 2-4% solution of Potassium hydrate and boil in an evaporating dish over a low flame for 20-30 min. Cook long enough to remove all the color from the tissue of the host.

3. Pour off the Potassium hydrate solution and wash by letting the material stand for 10-20 min. in each of two or three changes of clear water, stirring it about occasionally. If all the color is not removed from the host tissue cook again. Carefully pick away any pieces of subepidermal tissue that may cling to the epidermis.

4. Dehydrate in 95% alcohol.

5. Clear in carbol clearer (2 parts pure carbolic acid and 3 parts turpentine.)

6. Mount in Canada balsam.

The Advantages of this method may be summed up as follows:

1. The mycelium, pycnidia, etc., are preserved in their natural form and position on the surface of the host, and not all broken and disarranged as is the case when they are scraped from the surface.

2. In many cases of the forms the mycelium is so scanty that in an ordinary mount or section too little is present to show its nature, while by this method a large area is presented so that all the mycelium is sure to be present.

3. Pycnidia in all stages of development may be easily obtained and studied in their normal position and relation to the mycelium on which they are borne.

4. In order that the spores may be shown, a pycnidium at the side of the mount may be crushed with a dry scalpel while the material is still in the clearer.

5. By removing the color of the host cells there is nothing to interfere with the examination of the mycelium by transmitted light.

This method will be found most valuable in the case of those fungi having dark colored mycelium. Hyaline mycelium would be scarcely more evident than the colorless host cells. The whole secret of the process lies in the fact that the pigment in most of the higher plants (the hosts) is bleached by Potassium hydrate, while that of the parasite is not affected.

Very excellent results have been obtained in the case of the following fungi: *Cladosporium carpophilum* on the bark of peach twigs, *Leptothyrium pomi* on the fruit of cultivated apples, *Vermicularia circinans* on the outer leaves of onion bulbs, *Sphæroopsis malorum* on leaves of cultivated apples, *Macrosporium cucumerinum* on leaves of *Cucumis melo*.

Botanical Department, Cornell University.

THE FINDING OF PUCCINIA PHRAGMITIS (SCHUM.) KORN. IN NEBRASKA.

BY JOHN M. BATES.

On June 14th, 1901, while collecting asparagus rust in a garden in Kearney, Nebr., I found six or seven spots of pure white æcidia on *Rheum raphonticum* on the under side of the leaves. It was at once pronounced to be *Puccinia phragmitis*, and appeared to be on a new host for this country. This suggested further study of the species. This garden is three miles from the Platte River, and probably there is no patch of *Phragmites phragmites* nearer than this. About a mile west of Callaway, Custer County, there are several patches of this grass, and on this I found rust on the 28th of August of last year. The *Uredo* stage was just passing away at that date. This brought

up the question of where the æcidial stage might be found. Learning that Dr. Arthur had made cultures of æcidia on a *Rumex* from the teleutospores of *Phragmites* rust, it occurred to me that *Rumex britannica* which grows abundantly in these marshes must be the host plant. On April 9th I visited one of the patches of *Phragmites* and collected leaves for a culture. In my back yard is a large crown of *Rumex altissimus*, and over this I laid several rusted leaves of the *Phragmites*, putting a stone on one end and allowing the other to flop in the wind. On May 28th I found the Dock leaves heavily infected, some of the lower leaves having white æcidia ready for collection. This suggested a visit to the marsh containing *Rumex britannica*. Here I waded into the marsh and was rewarded by finding æcidia in abundance, but still a little immature. Specimens were collected for distribution.

I next began inspecting my neighbors' gardens and found good æcidia on *Rheum rhaponticum* in four gardens, two near my home, one three-quarters of a mile east, and the other four miles distant westward. I concluded from this that the spores had not come from my experiment, but were generally distributed by the wind.

A week later I collected another set of æcidia from *Rumex britannica* in the marsh, finding the spots lessening in number as the distance from the grass increased, and none at all a few hundred feet away.

On June 9th I found an æcidium in small quantity on *Rumex altissimus* by the creek bank, three blocks south of my home, and one good spot of it on *Rumex crispus*.

We have therefore, in twelve months, found the æcidia on four hosts in the Dock Family, namely; *Rheum rhaponticum*, *Rumex altissimus*, *Rumex britannica*, and *Rumex crispus*. The uredo and teleutospore stages are common on the Reed Grass—*Phragmites phragmites*. As this grass as well as *Rumex britannica* are common through the northern states it is probable that the rust may be found here and there if carefully searched for.

Red Cloud, Nebraska.

POISONING BY *LEPIOTA MORGANI* PK.

F. L. STEVENS.

The genus *Lepiota* according to Engler and Prantl, following Saccardo, contains some 270 species, about thirty of which are native to America, 18 being found in New York alone. It belongs to the white spored series of the *Agaricaceae* and is distinguished from the other members of this series by the absence of a volva, presence of an annulus, which is often moveable, and

by its free lamellæ. The fleshy pileus is usually scaly in this genus. The stalk is firm.

While this genus, in classification, falls somewhat near the deadly *Amanitas*, its members are usually considered wholesome, and several of them certainly are so.

The one species in question, *Lepiota Morgani* Pk., is a large attractive form which with its abundance of clean, firm flesh is especially tempting. This species may be distinguished by its greenish spores. By some it is regarded as edible, while by others it is viewed with suspicion.

The personal experience of the writer with this fungus, with an accurate account of symptoms written from notes made on the day of the experiment may be worthy of record in view of the somewhat indefinite position that the species occupies in the minds of mycophagists.

About three cubic centimeters of the pileus in fresh condition were eaten raw on August 21st at 12:45 P. M. The taste was mild and pleasant with no specially marked characteristics. At one o'clock I ate a full dinner, consisting of no unusual foods, and after dinner worked a bit in the hot sun from 1:30 to 2:30. In the meantime symptoms of slight dizziness gradually developed. The dizziness was so slight that it is perhaps proper to call it a lack of clearness, haziness or fogginess of the brain rather than real dizziness. This, at the time, was attributed to the intense heat of the afternoon. From 2:45 to 3 o'clock very slight gastric uneasiness, not nausea, merely disquiet, accompanied by slight tension of the muscles of the jaw, throat, and mouth was noticeable. At three o'clock, occurred, without an instant's warning sudden violent vomiting. This was painless and without nausea. The stomach's content was sour. This attack was immediately preceded by a few moments marked by cold sweat. The attack was repeated at 3:30, at 4 and at 4:40. Frequent sneezing, occasional slight chills and the foggy head occurred throughout this time. The symptoms were decidedly aggravated just prior to each attack of vomiting. The strength remained practically normal.

The writer travelled from Raleigh to Goldsboro in the interval between 3:30 and 6 P. M., drinking copious supplies of water as a stomach wash after 4 P. M. About 4:30 diarrhoea began. There was full control of the rectal muscles but the discharge was extremely watery. The last vomiting occurred at 4:40. The diarrhoea continued until six or eight o'clock. Slight pain in the region of the stomach and intestine was felt from 4:30 to 5:40. Mucus was abundant in the throat, coming probably from the stomach. After five o'clock there was rapid recovery to the normal. I ate a moderately large supper at 8 P. M., slept well and awoke in normal health next morning. All of the symptoms excepting the severe vomiting and diarrhoea

were mild. Health prior to the dinner was perfectly normal. The dinner was a usual one, partaken of by several other people, none of whom had any such symptoms.

There is no doubt of the identity of the species of which I had an abundant quantity for examination. One specimen with field notes was submitted to Mr. F. S. Earle, who also kindly determined the species for me. He says, "The plant seems to be a small form of *Lepiota Morgani* Pk."

The violence of the attack, its absolute coincidence with the ingestion of the fungus, its subsidence with the final rejection of the fungus, the subsequent and antecedent history of the subject, and the peculiar characteristic symptoms of intoxication, both in the digestive and nervous systems, all indicate clearly the poisonous nature of this species.

The specimens eaten were in perfectly fresh normal condition, picked in grass under trees. The extreme violence of the symptoms produced by such a small quantity of the fungus, makes one wonder what a meal from such might do.

While some claim to have eaten this species with impunity, and are inclined to regard the pain as resting with an idiosyncrasy of the subject, it is evident that one should determine his own personal resistance with considerable caution.

NEW SPECIES OF FUNGI.

J. B. ELLIS AND B. M. EVERHART.

The first two species given in the list were collected in California by Copeland and sent by C. F. Baker. The remainder were collected in the vicinity of London, Canada, by Professor J. Dearness.

RAMULARIA GLAUCA E. & E.—On leaves of *Sambucus glauca*, near Stanford University, California, Aug. 1903, (leg. Copeland Comm. C. F. Baker, 3738).

Spots amphigenous, dark-brown, $\frac{1}{2}$ -1 cm. diam. with a slightly raised border, orbicular or irregular outline. Hyphæ obsolete, the conidia arising directly from a tubercular base and forming a tuft about 75 μ diam. The conidia are hyaline, mostly continuous, oblong-fusoid, subcatenulate, 15-30 x 3-4 μ , about the same as those of *R. sambucina* Sacc. which differs in its small white spots.

SEPTORIA CHRYSAMPHORÆ E. & E.—On *Chrysamphora californica*, Mt. Eddy, California, Sept. 1903, (leg. Copeland, Comm. C. F. Baker, 3749).

Spots at first small (1-2 mm.), of a pale golden color, with a purplish areolate border, finally larger (1 cm.) and the purplish areola less distinct and narrower. Perithecia scattered on the

spots, sub-prominent, broadly perforated above, 100-125 μ diam. Sporules narrow-clavate, 30-50 x $2\frac{1}{2}$ μ , continuous, hyaline, gradually narrowed from the apex down.

CALOSPORA ALLANTOSPORA E. & E.—On dead limbs of *Cornus alternifolia*, and on Maple, *Acer saccharinum*, London, Canada, Oct. 1903 (Prof. J. Dearness, 2010).

Perithecia scattered, buried in the bark and penetrating to the wood, depressed-globose, $\frac{1}{2}$ mm. diam., brown, not polished, walls carbonaceo-coriaceous; ostium conic- or short-cylindrical, erumpent, rupturing the bark. Asci clavate, p. sp. 45-55 x 7-9 μ . Paraphyses 50-90 μ , long. Sporidia biserial, cylindrical, curved, hyaline, obtuse, very faintly 3-septate, 15-20 x $2\frac{1}{2}$ -3 μ , not constricted at the septa which are so faint as to be easily overlooked.

In the specimens on Maple the sporidia are smaller than in the specimens on *Cornus*.

The ostium arises through a flat black disc visible through the ruptured epidermis, as in *Clypeosphaeria*, and is easily broken off.

THYRIDIDIUM STILBOSTOMUM E. & E.—On dead Maple limb partly decorticated. London, Canada, Oct. 1903. (Dearness 3001).

Perithecia globose, $\frac{1}{3}$ - $\frac{1}{2}$ mm. diam., buried in the wood or bark, white inside. Ostium depressed-hemispherical, black and shining, pierced in the center with a minute opening. Asci cylindrical, stipitate, paraphysate, p. sp. 75-80 x 8-10 μ . Sporidia uniserial, elliptical, brown, 6-7-septate and sparingly muriform, more or less constricted at the middle septum, 22-27 x 7-10 μ .

The perithecia are scattered or 3-5 in a genuine stroma, and those on the decorticated wood are smaller but all have the same sporidia.

DIAPORTHE CARYIGENA E. & E.—On dead Hickory limbs, London, Canada, Oct. 1903. (Dearness, 2863).

Perithecia lying 3-6 together in the inner bark but not penetrating the wood, globose, small ($\frac{1}{2}$ mm.), each group surrounded by a black, circumscribing line which penetrates the wood for $\frac{1}{2}$ -1 mm. and when the limb is split appears like a section of a shallow cup, the included wood being of a much lighter color. Ostiola fasciculate, raising the epidermis into pustules and finally piercing but not laciniately rupturing it or rising above it, tips of ostiola smooth, papilliform. Asci subcylindrical, p. sp., about 60 x 10 μ . Sporidia mostly uniserial, elliptical, uniseptate, ends rounded and obtuse, constricted, each cell with a large transparent nucleus, 9-13 x $3\frac{1}{2}$ -4 $\frac{1}{2}$ μ .

D. eusticha E. & E., *D. woolworthii* Pk., *D. apocrypta* C. & E. have no circumscribing line and *D. corymbosa* C. & E. to which it comes nearest, has larger sporidia.

DIAPORTHE MICROSTROMA E. & E.—On Maple bark, London, Canada, Sept. 1903. (Dearness, 2986).

Stroma small ($\frac{1}{2}$ mm.), round, surrounded by a black, circumscribing line which penetrates the bark down to the surface of the wood, paler inside than the surrounding bark. Perithecia 1-4 (mostly 1-2) in a stroma, small (about $\frac{1}{4}$ mm.), with short, conic-papilliform ostiola, joined in a small black disc and slightly raising the bark but not exerted. Asci clavate-oblong, 80-100 x 15-20 μ , surrounded by abundant but evanescent paraphyses. Sporidia biseriate, at first fusoid and acutely pointed, when mature broader and more obtuse, uniseptate and constricted, 22-30 x 10-13 μ .

Differs from *D. ontariensis* E. & E. in its larger sporidia and the black circumscribing line not penetrating the wood. Prof. Peck who has examined these specimens says his *D. robusta* has larger pustules and smaller sporidia.

DIAPORTHE CATALPÆ E. & E.—On dead limbs of Catalpa, London, Canada, Oct. 1903. (Dearness, 2021).

Perithecia scattered or oftener 2-4 together, $\frac{1}{2}$ - $\frac{3}{4}$ mm. diam., about half sunk in the wood which is blackened on the surface and deeply penetrated by a black circumscribing line including a space of one or more centimeters in extent; ostiola subglobose, erumpent through an acutely elliptical black disc. Asci clavate-oblong, 40-50 x 6-7 μ . Sporidia subbiserial, fusoid-oblong, 4-nucleate, 10-12 x $2\frac{1}{2}$ -3 μ .

PSEUDOVALSA CANADENSIS E. & E.—On dead limbs of Hawthorn (*Crataegus*), London, Canada, Oct. 1903. (Dearness, 2993).

Perithecia $\frac{1}{2}$ - $\frac{3}{4}$ mm. in diam., buried in the unchanged substance of the wood, either scattered singly or in groups of 3-4, their obtuse, papilliform ostiola converging and raising the bark into pustules but scarcely exerted; walls of the perithecia subcoriaceous, thick, soon black and shining inside. Asci 150-250 x 8-10 μ , cylindrical, rounded at the summit, surrounded by abundant, filiform, guttulate, hyaline paraphyses. Sporidia cylindrical, obtusely pointed at the ends, yellowish-brown, 23-30 x 7-8 μ , 7-10-septate.

The inner surface of the bark is more or less blackened.

PSEUDOVALSA MINIMA E. & E.—On Maple bark, London, Canada, Nov. 1903. (Dearness, 2047).

Stroma orbicular or elliptical, small, (1-2 mm.), limited, cortical, formed from the substance of the bark which is blackened in the upper part of the stroma but is lighter than the surrounding bark below. Perithecia sunk in the bottom of the stroma, not penetrating the wood, 2-6 in a stroma, globose or ovate, 400 μ diam. with rather thick, coriaceous walls. Ostiola subconical, erumpent in a small black disc, but scarcely exerted. Asci cylin-

drical, $100-120 \times 7 \mu$. Sporidia uniseriate, oblong elliptical, 3-septate, scarcely constricted, olive-brown, $12-15 \times 3\frac{1}{2} \mu$. The ostiola raise the bark into little pustules which are not very conspicuous.

This comes near *P. comptoniae* E. & E.

DIATRYPELLA XANTHOSTROMA E. & E.—On dead limbs of *Pirus japonica*, London, Canada, Nov. 1903. (Dearness, 2045).

Stroma tubercular-erumpent, 2-4 mm. diam. rather flattened on top and bearing adherent fragments of the ruptured epidermis, black outside, yellow within (the same shade of yellow seen in *Hypoxylon sassafras* Sz.) Perithecia 4-10 in a stroma, globose or slightly flattened laterally, subfarinaceous outside, about $\frac{1}{2}$ mm. diam., abruptly contracted above into short necks with variable ostiola, papilliform, conical, or obscure, finally rather broadly perforate above. Asci clavate-oblong, $55-65 \times 8-10 \mu$, polysporous. Sporidia allantoid, yellowish-hyaline, slightly curved, 9-10 (exceptionally 9-12 $\times 2 \mu$).

This comes near *D. frostii* Pk. but the sporidia are longer and the yellow color of the stroma inside is different.

UREDINEOUS INFECTION EXPERIMENTS IN 1903.⁽¹⁾

W. A. KELLERMAN.

Artificial infection experiments with certain species of *Puccinia* and *Uromyces*, continuation of those published one year ago, are here reported for the current season, beginning March 5th and ending June 18, 1903. Attention is called to the preceding report where explanations are made relative to the plan and execution of the work—substantially the same being followed during the season now under consideration.

It may be mentioned that pre-season experimentation, or at least very early inoculations, proved very advantageous again, as in the preceding year. For example, in case of the demonstrated connection between *Puccinia muhlenbergiae* Arth. & Holw. and *Aecidium hibisciatum* Schw., quite unexpected, repetition of the inoculation three times was possible, the last time with the host plants growing in their natural habitat. Had this not been possible judgment would perhaps have been held in suspense, but under the circumstances a positive conclusion was not deferred to another year.

Advantageous and desirable as it is to carry on germination tests before making the inoculations, I can not think it objection-

⁽¹⁾ Contributions from the Botanical Laboratory of the Ohio State University. XV.

Presented before the Botanical Society of America, at St. Louis, December, 1903.

able in any case to use material untested or that has proven refractory under trial — and I do not speak wholly without experience in regard to this matter. The artificial conditions that must in all cases obtain, can reasonably be supposed responsible for occasional negative results. In case the spores sown actually infect the host, nothing was gained by the labor and loss of time in the pre-germination tests. These suggestions make it desirable that I insist on the slight stress that should be placed on negative results; they should never be taken as necessarily conclusive. When we reflect on the very many possible causes of failure in connection with any artificial infection no valid objection, in my opinion, can be urged against the view presented. On the other hand a positive result under properly imposed conditions and crucial exactions settles the question at once — though repetition only would satisfy very skeptical minds.

Relative to the experiments outlined below, I may say that twenty-two species of Rusts were used, and in case of nine of them inoculations were successful. This is about the same ratio between success and failure as obtained in the work of the previous season. In a few cases the failure was a foregone conclusion, due to poor “seed” or unsatisfactory host plants; still in spite of the narrow or negative chances of success inoculations were attempted. An unusually large number of tests were made with the Sunflower rust. Nineteen species of *Helianthus* were used and Rust from four species applied — though unfortunately with very meager results, it must be confessed — and in some other cases an unusually large number of host plants were used; it therefore happened that the total number of inoculations, Nos. 68-260, was relatively quite large, namely 193. Turning now to the details of the experiments, recording briefly the facts in each case and commenting as seems necessary the report is as follows:

PUCCINIA ANGUSTATA Pk. from SCIRPUS ATROVIRENS Muhl.

With material collected at Sandusky, Ohio, in April 1903, repeating the culture of this species — the connection of which with *Aecidium lycopi* Ger. was originally determined by Dr. Arthur, a single experiment as given below was undertaken. The teleutospores sown on *Lycopus americanus* produced the aecidia in abundance, thus corroborating Dr. Arthur's work, and obviating the necessity of further explanation here. The record of the experiment is as follows:

Exp. 180. May 28. Teleutospores from *Scirpus atrovirens* Muhl. applied to *Lycopus americanus* Muhl. June 6, *spermogonia* abundant; June 10, *aecidia* abundant.

PUCCINIA CAULICOLA Tr. & Gall. from SALVIA LANCEOLATA Muhl.

Teleutosporic material of this species was kindly sent me by Mr. E. Bartholomew in April 1903 from Rockport, Rooks Co., Kansas. Cultures were made on seedling plants of *Salvia lanceolata* Muhl. grown in the greenhouse—the seed also furnished by Mr. Bartholomew. Some adventive plants of this western species had previously been found by a roadside in the suburbs of Columbus, Ohio, and they also furnished opportunity for attempted inoculations with the species under consideration. Infections were obtained in case of the seedling plants in the greenhouse—the aecidia appearing in due time though by no means abundant. Re-inoculation at a later date, with teleutospores from same source, was also successful.

This demonstrates the existence of an aecidial stage for this species—not before reported—and establishes the connection of teleutospores and aecidia on the same host. Mr. Bartholomew searched for aecidia in Kansas but found only uredo and teleutospores on the indigenous *Salvia lanceolata*. Attempted inoculation of the adventive plants at Columbus, Ohio, done under very unfavorable conditions, were not successful.

No spermogonia were seen. A satisfactory diagnosis of the aecidia can not be given from the scant material obtained—about a dozen sori—but the following may be offered:

AECIDIUM CAULICOLUM.—Sori mostly epiphyllous, few, scattered, forming sordid-yellowish spots and which are inconspicuous on the under side of the leaf, less than 0.5 to 1 mm. or more in diameter, circular in outline. On one leaf occurred besides several epiphyllous sori, also a single hypophyllous linear sorus, about 6 mm. long, following a prominent vein near the base of the lamina which it distorted to semicircular outline. Aecidia sometimes limited to one or very few in a sorus, sometimes 10 or 12 (over two dozen in the single linear sorus above described), 210-350 μ diameter, when ruptured the edge somewhat regularly lacerate but scarcely recurved. Peridial cells very large. Aecidiospores pale golden yellow, echinulate, globular to oblong or sub-ovate, 10-25 x 17-20 μ ; pores not seen.

Exp. 181. May 28. Teleutospores of *Puccinia caulicola* Tr. & Gall. applied to seedling plants of *Salvia lanceolata* Willd. June 9, scattered amphigenous aecidia.

Exp. 242. June 17. Same to *Salvia lanceolata* Willd. Aecidia noticed July 11, (perhaps appeared earlier).

Exp. 243. June 17. Same to *Urtica gracilis* Ait. No infection.

Exp. 244. June 17. Same to *Monarda fistulosa* L. No infection.

Exp. 245. June 17. Same to *Salvia lanceolata* Willd., adventive plants on Greenlawn Ave., Columbus, Ohio. No infection detected.

PUCCINIA CARICIS-ERIGERONTIS Arth. from CAREX
FESTUCACEA Willd.

I am indebted to Dr. Arthur for culture material for this species, collected in Indiana, April 14, 1903. The experiment besides, was merely a repetition of his own, and proved to be a corroboration of the result formerly published. Abundant aecidia appeared on the Erigeron (Leptilon) but no infection resulted when teleutospores were applied to other hosts as the following record shows.

- Exp. 186. May 29. Teleutospores from Carex festucacea Willd., applied to Erigeron pulchellus Mx. (Erigeron bellidifolius Muhl.) *No infection.*
 Exp. 187. May 29. Same to Leptilon canadense (L.) Britt. (Erigeron canadense L.). *Abundant spermogonia June 6, and aecidia June 10.*
 Exp. 188. May 29. Same to Rudbeckia speciosa Wenderoth. *No infection.*
 Exp. 197. May 29. Duplicate of 186. *No infection.*
 Exp. 198. May 29. Duplicate of 187. *Infection same as in 187.*
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PUCCINIA CARICIS-SOLIDAGINIS Arth. from CAREX
STIPATA Muhl.

Abundant Rust for cultures was collected at Buckeye Lake, Ohio, November 1, 1902, and kept in cloth sacks exposed all winter (hanging in a Norway Spruce tree). This was used April 25 on eight different hosts, none but Solidago canadensis becoming infected. It will be noticed from the record below that Solidago riddellii did not seem to be susceptible. Dr. Arthur used Solidago canadensis L., S. serotina Ait., S. caesia L., S. ulmifolia Muhl. and S. rigida L. with success, as given in his report of cultures in Botanical Gazette, January, 1903.

- Exp. 151. April 25. Teleutospores from Carex stipata Muhl., applied to Hibiscus moscheutos L. *No infection.*
 Exp. 152. April 25. Same to Solidago canadensis L. *Spermogonia appeared May 3, and aecidia May 6.*
 Exp. 153. April 25. Same to Solidago riddellii Fr. *No infection.*
 Exp. 154. April 25. Same to Verbesina alternifolia (L.) Britt. (Actinomeris squarrosus Nutt.) *No infection.*
 Exp. 155. April 25. Same to Erigeron annuus (L.) Pers. *No infection.*
 Exp. 156. April 25. Same to Carduus altissimus L. *No infection.*
 Exp. 157. April 25. Same to Ambrosia trifida L. *No infection.*
 Exp. 158. April 25. Same to Rudbeckia speciosa Wenderoth. *No infection.*

PUCCINIA CIRSII-LANCEOLATI Schroet. from
CARDUUS LANCEOLATUS L.

This species was described by J. Schroeter, in *Kryptogamen-Flora von Schlesien*, 317, 1889, (pp. 257-384 published 27 August 1887), aecidia, uredo and teleutospores being included. The Rust on the same host in this country has usually been listed as *Puccinia cirsii* Lasch by American authors, since the aecidial stage was not in evidence. Having suitable material for culture experiments, work was begun with a view of searching especially for aecidia, March 20th, using as host plants the same species which furnished the teleutospores, namely, *Carduus lanceolatus*, and many other Compositæ as indicated in the record below. No infections resulted except on *Carduus lanceolatus*. What at the time were somewhat doubtfully supposed to be spermogonia, are recorded in my notes, but I could not later verify the accuracy of the same; their occurrence is therefore not demonstrated and improbable. But a fair number of the peculiar aecidial sori appeared in due time on two or three leaves of the host plant. Later, uredo and teleutospores followed. Repetitions were not successful—but may have been owing to lateness of season when work was carried on.

When inoculations were instituted specimens were sent to European authority, and the supposition that our material should be called *Puccinia cirsii-lanceolati* was approved; specimens of European material showing the aecidial stage are now at our service for comparison. The testimony is clear that we have to do with a Eu-Puccinia; it is autoecious. To avoid the necessity of using a 'round about' mode of expression when referring to the aecidial stage it is proposed to use the terminology as follows: *Aecidium cirsii-lanceolati*. Unfortunately Schroeter's description is so meager as the following for the aecidia: "Aecidien in kleinen Gruppen zusammengestellt. Pseudoperidien sehr locker gefügt, weit becherförmig. Sporen elliptisch mit farbloser, feinwarziger Membran und hell orange-rothem Inhalt." Our material accords in the main with the above—but it is being subjected to more careful study and the results, including a fuller description, will be published later. Dates of cultures, etc., are as follows:

- Exp. 77. March 20. Teleutospores from *Carduus lanceolatus* L. applied to *Carduus lanceolatus* L. *Spermogonia* (?) on two plants appeared March 28; aecidia developed April 3; uredo and teleutospores in considerable abundance were observed some time thereafter. (Record for *Spermogonia* is now considered incorrect.)
- Exp. 78. March 20. Same to *Lactuca virosa* L. No infection.
- Exp. 79. March 20. Same to *Taraxacum erythrospermum* Andr. No infection.

- Exp. 80. March 20. Same to *Erigeron annuus* (L.) Pers. *No infection.*
 Exp. 83. March 29. Same applied to *Carduus lanceolatus* L. *No infection.*
 Exp. 84. March 29. Same to *Chrysanthemum indicum* Hort. *No infection.*
 Exp. 85. March 29. Same to *Taraxacum erythrospermum* Andr. *No infection.*
 Exp. 86. March 29. Same to *Erigeron annuus* (L.) Pers. *No infection.*
 Exp. 87. March 29. Same to *Lactuca virosa* L. *No infection.*
 Exp. 119. April 11. Same to *Carduus lanceolatus* L. *No infection.*
 Exp. 120. April 11. Same to *Carduus altissimus* L. *No infection.*
 Exp. 159. May 5. Same to *Carduus lanceolatus* L. *No infection.*
 Exp. 160. May 5. Same to *Carduus altissimus* L. *No infection.*
 Exp. 99. March 30. Aecidiospores from *Puccinia cirsii-lanceolati* Schroet., applied to *Carduus lanceolatus* L. *No infection.*

PUCCINIA HELIANTHI Schw. from HELIANTHUS AMBIGUUS (E. & G.) Britt., H. ANNUUS L., H. DECAPETALUS L. and H. MOLLIS Lam.

This species has proven more or less refractory in the hands of recent experimenters. In Europe Woronin, as long ago as 1872 published interesting inoculation experiments, in the Botanische Zeitung No. 38 & 39, 30 Jahrgang, (Sept. 20 & 27), (Aus dem russischen Originale auszöglich mitgetheilt), which he executed at St. Petersburg, Russia, the cultivated *Helianthus annuus* L. in that country being an important farm crop. His main purpose was to determine whether this prevalent and very damaging species of Rust was the same as that occurring on other Compositæ of that region, and which he rightly decided in the negative. His cultures also were designed to show whether the Rust on "Erdbirne," *Helianthus tuberosus*, (*Puccinia helianthorum* Schw.) was the same as the "Sonnenblume" Rust (*P. helianthi* Schw.). He states that his experiments led him to the conclusion that the two are entirely different, an opinion also shared by de Bary based on his own cultures.

This matter was taken up recently by Ernst Jacky, who reports his results in the Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankh. 2 Abt. 9:802, 6 Dec. 1902. He shows that *Puccinia helianthi* is an aut-eu-puccinia — the pycnidia, æcidia, uredo and teleutospores produced by sowings of teleutospores from *Helianthus annuus*, on *H. annuus*, *H. cucumerifolius*, and *H. californicus*, but the species not able to live on *H. tuberosus*, *H. maximiliani*, *H. multiflorus*, *H. scaberrimus*, and *H. rigidus*.

In this country Carleton reported work with this Rust, in Science N. S. 13:250, 15 February 1901. His words are as fol-

lows: "Culture experiments were also performed with the common Sunflower Rust, which showed that the *Puccinia* and *Aecidium* found on Sunflower are stages of one and the same species. At the same time it is made probable that all the species of *Helianthus* affected bear the same Rust and that there is no distinction of host forms."

Dr. Arthur sowed teleutospores from *Helianthus grosse-serratus* Mart. on the same host and on *H. maximiliani* Schrad.; cultures successful. He adds that sowings at two different dates on *H. strumosus* gave no infection.

Such facts on record induced me to make as large number of cultures as possible, hoping to furnish worthy testimony in the case. But my success was slight, my failure was great. I used teleutospores from three species of *Helianthus* as stated above. Inoculations were attempted on nineteen species as hosts, namely, *H. annuus*, *atrorubens*, *decapetalus*, *divaricatus*, *doronicoides*, *gigantea*, *grosse-serratus*, *hirsutus*, *kellermani*, *laetiflorus*, *longifolius*, *maximiliani*, *mollis*, *multiflorus*, *orgyalis*, *strumosus*, *subtuberosus*, *tracheliiifolius*, and *tuberosus*.

I am sorry to record that the only successful inoculations were those with teleutospores of *Helianthus mollis* Lam. on *H. annuus* and *H. mollis*. A few inoculated leaves of each of these two species produced a small number of aecidia. Repetitions with this and other inoculating material were unsuccessful — and the reason for such failure is not clear. The material in case of *H. annuus* was unfortunately quite small in quantity and at the time not considered satisfactory. That from *H. decapetalus* and *H. ambiguus* was abundant but the quality was suspected. But that from *H. mollis* was apparently in good condition. It had been exposed in the natural habitat all winter, and collected April 2, near Sandusky, Ohio. In spite of the above I do not at all think the negative results of great significance. Of course this Rust on *H. mollis* will grow on *H. annuus*, but I do not suppose it will necessarily fail to grow on others — in fact I fully believe at the hands of other experimenters or under other conditions more abundant success will be vouchsafed. It may be well briefly to record the data of the experiments.

Expts. 100-114. April 5. Teleutospores from *Helianthus mollis* Lam., applied to *Helianthus mollis* Lam., *annuus* L., *giganteus* L., *laetiflorus* Pers., *hirsutus* Raf., *tuberosus* L., *orgyalis* DC., *divaricatus* L., *mollis* Lam., *tracheliiifolius* Mill., *strumosus* L., *atrorubens* L., *kellermani* Britt., and *grosse-serratus* Mart. *Spermogonia* appeared on *H. annuus* L. (Exp. 101) April 18, and aecidia April 24; ditto *H. mollis* Lam. (Exp. 109).

Expts. 170-179. May 24. Same to *Helianthus mollis* Lam., *laetiflorus* Pers., *maximiliani* Schrad., *orgyalis* DC., *kellermani* Britt., *hirsutus* Raf., *tuberosus* L., *giganteus* L., *subtuberosus* Bourg., *longifolius* Ph. No infection.

- Expts. 247-254. June 18. Teleutospores of *Helianthus mollis* from Indiana (sent by Dr. Arthur), applied to *Helianthus longifolius* Ph., *orgyalis* DC., *mollis* Lam., *hirsutus* Raf., *gigantea subtomentosa*, *laetiflorus* Pers., *maximiliana* Schrad., and *atrorubens* L. *No infection.*
- Expts. 121-137. April 19. Teleutospores from *Helianthus annuus* applied to *Helianthus annuus* L., *doronicoides* Lam., *mollis* Lam., *laetiflorus* Pers., *hirsutus*, Raf., *maximiliani* Schrad., *longifolius* Ph., *grosse-serratus* Mart., *laetiflorus* Pers., *kellermani* Britt., *giganteus* L., *subtuberosus* Bourg., *tracheliifolius* Mill., *strumosus* L., *tuberosus* L., *decapetalus* L., *multiflorus* L. *No infection.*
- Expts. 255-260. June 18. Same to *Helianthus atrorubens* L., *hirsutus* Raf., *mollis* Lam., *orgyalis* DC., *subtuberosus* Bourg., and *Nabalus alba* (L.) Hook. (*Prenanthes alba* L.). *No infection.*
- Expts. 69-76. March 5. Teleutospores from *Helianthus decapetalus* L., applied to *decapetalus* L., *giganteus* L., *mollis* Lam., *atrorubens* L., *kellermani* Britt., *laetiflorus* Pers., *orgyalis* DC., *annuus* L. *No infection.*
- Expts. 88-98. March 29. Applied teleutospores from *Helianthus ambiguus* (T. & G.) Britt. to *Helianthus annuus* L., *giganteus* L., *gigantea subtomentosa*, *hirsutus* Raf., *strumosus* L., *orgyalis* DC., *laetiflorus* Pers., *tuberosus* L., *grosse-serratus* Mart., *mollis* Lam., *kellermani* Britt. *No infection.*
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PUCCINIA HIBISCIATA (Schw.) Kellerm. from MUHLENBERGIA MEXICANA (L.) Trin., M. DIFFUSA Willd., and M. RACEMOSA (Mx.) B. S. P.

The connection established between the teleutosporic stage of this Rust — originally called *Puccinia windsoriæ* but latterly designated by Arthur and Holway as *P. muhlenbergiæ* — and the *Aecidium hibisci* Schw. occurring on *Hibiscus moscheutos*, was published immediately on the conclusion of two sets of satisfactory experiments. See Jour. Mycol. 9:109-110, May 1903. But the report there printed does not cover the entire work with the species in question — dealing as may be recalled only with the Rust from one species only of *Muhlenbergia*, and with one species only of *Hibiscus* as the aecidial host.

It is to be added that with similar care and well grounded hopes of success, inoculations were attempted with teleutospores from *Muhlenbergia diffusa* Willd. This had been collected November 1, 1902, the same day on which the *Muhlenbergia mexicana* was obtained, and kept exposed all winter in suitable sacks by the side of the latter. *Muhlenbergia mexicana* was collected on the north shore of Buckeye Lake, Licking Co., Ohio, and *M. diffusa* was taken a mile distant where (on the south side of the lake) it was common though not abundant.

Aecidium hibisci has been for years occurring in great abundance on *Hibiscus moscheutos* at both of the places just mentioned. No infections were secured, the host plants used

being *Hibiscus moscheutos* L., *H. militaris* Cav., and *Althaea rosea* (Cav.)

Furthermore, Rev. J. M. Bates kindly furnished me from Nebraska, an ample quantity of *Muhlenbergia racemosa* (Mx.) B.S.P. that harbored the Rust, and the latter was used in an attempted inoculation of *Hibiscus moscheutos* L., *H. militaris* Cav., and *Napaea dioica* L. In no case was an infection secured.

It is not clear how the failures in the above cases should be explained. The apparent conditions were all favorable—though of course no one can pronounce conclusively thereupon. A suggestion may possibly be apropos, namely, that we have here to do with physiological forms restricted to different hosts. The hypothesis signifies nothing however until positive results may be obtained with material from the hosts named. A careful examination by the aid of student J. N. Frank, revealed to us no morphological differences between the spores found on the three species of *Muhlenbergia*. However the sori on *Muhlenbergia mexicana* were more numerous—the plants in fact quite blackened with the rust and easily noticed in their natural habitat, at a distance of three or four rods.

Finally it is to be noted that successful inoculations (Exp. 165) were made with teleutospores from *Muhlenbergia mexicana* on *Hibiscus militaris* Cav. Attempted infection of several other species of plants of the same and of different orders was not successful. The complete record follows.

- Exp. 146. April 24. Teleutospores from *Muhlenbergia mexicana* (L.) Trin. applied to *Hibiscus moscheutos* L. *Spermogonia* May 5, (abundant May 8); *aecidia* May 15.
- Exp. 147. April 24. Same to *Rudbeckia speciosa* Wenderoth. *No infection.*
- Exp. 148. April 24. Same to *Urtica gracilis* Ait. *No infection.*
- Exp. 149. April 24. Same to *Ambrosia trifida* L. *No infection.*
- Exp. 150. April 24. Same to *Erigeron annuus* (L.) Pers. *No infection.*
- Exp. 161. May 5. Same to *Hibiscus moscheutos* L. *Spermogonia abundant May 13, and aecidia later.*
- Exp. 162. May 23. Same to *Althaea rosea* Cav. *No infection.*
- Exp. 163. May 23. Same to *Malva rotundifolia* L. *No infection.*
- Exp. 165. May 23. Same to *Hibiscus militaris* Cav. *Spermogonia June 3, aecidia very abundant* (date lost).
- Exp. 222. June 7. Same to *Hibiscus moscheutos* L. *Aecidia June 16.*
- Exp. 223. June 7. Same to *Althaea rosea* Cav. *No infection.*
- Exp. 228. June 8. Same to *Abutilon abutilon* (L.) Rusby. *No infection.*
- Exp. 182. May 28. Teleutospores from *Muhlenbergia diffusa* Willd. applied to *Hibiscus moscheutos* L. *No infection.*
- Exp. 183. May 28. Same to *Althaea rosea* Cav. *No infection.*
- Exp. 184. May 28. Same to *Hibiscus militaris* Cav. *No infection.*
(Apparently one spermogonial spot—but doubtless to be referred to accidental infection from another experiment.)
- Exp. 166. May 24. Teleutospores from *Muhlenbergia racemosa* (Mx.) B. S. P. applied to *Hibiscus moscheutos* L. *No infection.*
- Exp. 167. May 24. Same to *Althaea rosea* Cav. *No infection.*
- Exp. 168. May 24. Same to *Napaea dioica* L. *No infection.*
- Exp. 169. May 24. Same to *Hibiscus militaris* Cav. *No infection.*

PUCCINIA LATERIPES Berk. et Rav. from RUELLIA STREPENS L.

A report of the success of cultures of this species has been published on preceding pages (Jour. Mycol. 9:107-9, May 1903), and below are recorded the details of the experiments. It had been assumed perhaps on ample grounds, that this species was autoecious, but heretofore no experiments in artificial infections were on record. It will be found stated in the previous report, and indicated in the record below that what might be termed a 'natural infection' was induced by placing infected soil or humus — old leaves and debris with soil at the base of plants of *Ruellia strepens* on whose leaves and stems abundant teleutospores were noticed the preceding season — around the host plants in pots in the greenhouse, which were used in the cultures. Besides, infections with teleutospores by the usual method of artificial inoculations was practiced. In a third set of inoculations uredospores (obtained in previous cultures) were used. Pronounced success attended all of the experiments, making a conclusion entirely satisfactory. That the aecidal form of this species has not heretofore been designated by a binomial for convenient reference is unfortunate, and therefore the name here recorded, *Aecidium lateripes*, will obviate future inconvenience. The following is copied from my note book.

- Exp. 81. March 5. Soil and humus from base of *Ruellia strepens* L. known to be infected the preceding year, placed around plants of *Ruellia strepens* L. in three pots grown in greenhouse since January 30. *Spermogonia* appeared (in case of plants in two pots) March 23; *aecidia* developed April 1; later in season very abundant uredospores and teleutospores.
- Exp. 82. April 2. Teleutospores from stems of *Ruellia strepens* L. exposed all winter but brought into greenhouse March 5, applied to *Ruellia strepens* L., 3 to 10 inches high. *Aecidia* appeared April 10; *uredo* and teleutospores in abundance in May and June.
- Exp. 115. April 11. *Aecidia* obtained in Exp. 82 applied to *Ruellia strepens* L. *Uredo* appeared April 25; later a quantity of teleutospores.
- Exp. 138. April 19. *Aecidia* obtained in Exp. 82, applied to *Ruellia strepens* L. Successful (but date lost).

PUCCINIA SUBNITENS Diet. from DISTICHLIS SPICATA (L.) Greene.

In 1902 Dr. Arthur used material furnished by Rev. J. M. Bates, Nebraska, on *Chenopodium album* L. and obtained aecidia identified as *Aecidium ellisii* Tr. & Gall. The same collector also kindly sent me suitable inoculating material on the teleuto-

sporic host named, in March 1903, which was used with success on *Chenopodium album* L. as the record below shows. Mr. Bates originally suggested a probable connection of the Rust with the *Aecidium* on *Chenopodium leptophyllum* (Moq.) Nutt., but as yet no experimental inoculation on this host has been published.

Exp. 220. June 7. Teleutospores applied to *Chenopodium album* L.
June 21, aecidia abundant.

The following record of failures, significant perhaps in a few cases, are here set down without further comment.

PUCCINIA CARICINA DC. FROM CAREX COMOSA BOOTT.

Exp. 200. April 5. Teleutospores applied to *Urtica gracilis*. No infection.

PUCCINIA CARICINA DC. FROM CAREX COSTELLATA BRITT.

Exp. 211. June 6. Teleutospores applied to *Urtica gracilis*. No infection.

Exp. 211. June 6. Same to *Ambrosia trifida* L. No infection.

Exp. 213. June 6. Same to *Agrimonia parviflora* Soland. No infection.

Exp. 214. June 6. Same to *Lycopus americanus* Muhl. No infection.

Exp. 224. June 7. Same to *Xanthoxylum americanum* Mill. No infection.

PUCCINIA CARICINA DC. FROM CAREX CRINITA LAM.

Exp. 221. June 7. Teleutospores applied to *Leptilon canadense* (L.) Britt. No infection.

Exp. 230. June 16. Same to *Urtica magellanica* Poir. No infection.

PUCCINIA CARICINA DC. FROM CAREX HYSTRICINA MUHL.

Exp. 201. June 6. Teleutospores applied to *Urtica gracilis* Ait. No infection.

Exp. 202. June 6. Same to *Impatiens biflora* Walt. No infection.

Exp. 203. June 6. Same to *Rudbeckia speciosa* Wenderoth. No infection.

Exp. 204. June 6. Same to *Eupatorium ageratoides* L. f. No infection.

PUCCINIA CARICINA DC. FROM CAREX LANUGINOSA MX.

Exp. 215. June 6. Teleutospores applied to *Urtica gracilis* Ait. No infection.

Exp. 216. June 6. Teleutospores applied to *Solidago flexicaulis* L. No infection.

Exp. 217. June 6. Same to *Carduus altissimus* L. No infection.

Exp. 229. June 8. Same to *Leptilon canadense* (L.) Britt. No infection.

PUCCINIA CARICINA DC. FROM CAREX LUPULINA MUHL.

Exp. 207. June 6. Teleutospores applied to *Urtica gracilis* Ait. No infection.

Exp. 208. June 6. Same to *Lycopus americanus* Muhl. No infection.

Exp. 209. June 6. Same to *Cimicifuga racemosa* (L.) Nutt. No infection.

Exp. 210. June 6. Same to *Erigeron annuus* (L.) Pers. No infection.

PUCCINIA CARICINA DC. FROM CAREX SCOPARIA SCHK.

- Exp. 199. June 5. Teleutospores from Eugene, Oregon, sent by Professor A. R. Sweetser, applied to *Urtica gracilis* Ait. No infection.

PUCCINIA CARICINA DC. FROM CAREX SQUARROSA L.

- Exp. 205. June 6. Teleutospores applied to *Urtica gracilis* Ait. No infection.
Exp. 206. June 6. Same to *Erigeron annuus* (L.) Pers. No infection.

PUCCINIA EMACULATA SCHW. FROM PANICUM CAPILLARE, L.

- Exp. 231. June 16. Teleutospores applied to *Ribes cynosbati* L. No infection.
Exp. 232. June 16. Same to *Urtica gracilis* Ait. No infection.
Exp. 233. June 16. Same to *Rumex britannica* L. No infection.
Exp. 235. June 16. Same to *Aster prenanthoides* Muhl. No infection.
Exp. 236. June 16. Same to *Lycopus americanus* Muhl. No infection.

PUCCINIA IMPATIENTIS (SCHW.) ARTH. FROM ELYMUS VIRGINICUS L.

- Exp. 185. May 29. Teleutospores furnished by Dr. Arthur, cult. 148, Indiana, April 17, applied to *Impatiens biflora* Walt. No infection. Perhaps if the waxy coating of the leaves had been removed more or less completely, the inoculation would have been successful.

PUCCINIA MALVACEARUM BERTERO FROM MALVA BOREALIS WALLM.

- Exp. 225. June 7. Teleutospores received from Miss Minnie Reed, Santa Ana, California, February 25, on living plant, applied to *Althaea rosea* Cav. No infection.
Exp. 226. June 7. Same to *Malva rotundifolia* L. No infection.
Exp. 227. June 7. Same to *Abutilon abutilon* (L.) Rusby. No infection.

PUCCINIA MENTHA PERS. FROM KOELLIA VIRGINIANA (L.) MACM.

- Exp. 194. May 29. Teleutospores collected at Wauseon, Fulton Co., Ohio, applied to *Blephilia hirsuta* (Ph.) Torr. No infection.
Exp. 195. May 29. Same to *Mentha piperita* L. No infection.
Exp. 196. May 29. Same to *Monarda fistulosa* L. No infection.

PUCCINIA PANICI DIET. FROM PANICUM VIRGATUM L.

- Exp. 237. June 17. Teleutospores collected at Sandusky, Ohio, May, applied to *Solidago canadensis* L. No infection.
Exp. 238. June 17. Same to *Aster prenanthoides* Muhl. No infection.
Exp. 239. June 17. Same to *Agrimonia parviflora* Soland. No infection.
Exp. 240. June 17. Same to *Urtica gracilis* Ait. No infection.

PUCCINIA POCULIFORMIS (JACQ.) WETTST. FROM TRITICUM VULGARE VILL.

- Exp. 118. Teleutospores applied to *Berberis vulgaris* L. No infection.

PUCCINIA POLYGONI-AMPHIBII PERS. FROM POLYGONUM EMERSUM (Mx.) BRITT.

- Exp. 141. April 24. Teleutospores obtained at Buckeye Lake, Licking Co., Ohio, applied to *Hibiscus moscheutos* L. No infection.
Exp. 142. April 24. Same to *Rudbeckia speciosa* Wenderoth. No infection.

- Exp. 143. April 24. Same to *Urtica gracilis* Ait. No infection.
Exp. 144. April 24. Same to *Ambrosia trifida* L. No infection.
Exp. 145. April 24. Same to *Erigeron annuus* (L.) Pers. No infection.
Exp. 189. May 29. Teleutospores from Fair Oaks, Indiana, sent by Dr. Arthur, applied to *Polygonum emersum* (Mx.) Britt. No infection.
Exp. 190. May 29. Same to *Rumex verticillatus* L. No infection.

PUCCINIA SORGHII SCHW. FROM ZEA MAYS L., SWEET CORN.

- Exp. 117. April 11. Teleutospores applied to *Zea mays*, Yellow Dent Corn. No infection.

PUCCINIA THOMPSONI HUME, FROM CAREX FRANKII KUNTH.

- Exp. 191. May 29. Teleutospores applied to *Cimicifuga racemosa* (L.) Nutt. No infection.
Exp. 192. May 29. Same to *Erigeron pulchellus* Mx. No infection.
Exp. 193. May 29. Same to *Solidago flexicaulis* L. No infection.

PUCCINIA VERATRI NIESSL. FROM VERATRUM VIRIDE AIT.

- Exp. 149. April 20. Teleutospores collected at Cheat Bridge, West Virginia, applied to *Veratrum viride* Ait. No infection; but the host plants were in poor condition; not growing and soon died.
Exp. 246. June 18. Same to *Veratrum viride* Ait. No infection; the host plant was wilted and soon died.

PUCCINIA VILFAE A. & H. FROM SPOROBOLUS LONGIFOLIUS (TORR.) WOOD.

- Exp. 218. June 6. Teleutospores furnished by Rev. J. M. Bates, Red Cloud, Nebraska, applied to *Chenopodium album* L. No infection.
Exp. 219. June 6. Same to *Verbena urticaefolia* L. No infection.

UROMYCES BURRILLII LAG. FROM SCIRPUS FLUVIATILIS (TORR.) GR.

- Exp. 116. April 11. Teleutospores applied to *Hibiscus moscheutos* L. No infection.
Exp. 139. April 20. Same to *Hibiscus moscheutos* L. No infection.

SUMMARY OF SUCCESSFUL INOCULATIONS.

Puccinia angustata Peck, teleutospores from *Scirpus atrovirens* Muhl; obtained aecidia [*Aecidium lycopi* Ger.] on *Lycopus americanus* Muhl.

Puccinia caulicola B. & Rav., teleutospores from *Salvia lanceolata* Willd.; obtained aecidia [*Aecidium caulicolum* Kellerm.] on *Salvia lanceolata* Willd.

Puccinia caricis-erigerontis Arth., teleutospores from *Carex festucacea* Willd.; obtained aecidia (*Aecidium erigeronatum* Schw.) on *Leptilon canadense* (L.) Britt.

Puccinia caricis-solidaginis Arth., teleutospores from *Carex stipata* Muhl.; obtained aecidia on *Solidago canadensis* L.

Puccinia cirsii-lanceolati Schroet., teleutospores from *Carduus lanceolatus* L.; obtained aecidia [*Aecidium cirsii-lan-*

ceolati Kellerm.], uredo and teleutospores on *Carduus lanceolatus* L.

Puccinia helianthi Schw., teleutospores from *Helianthus mollis* Lam.; obtained aecidia on *Helianthus annuus* L. and *H. mollis* Lam.

Puccinia hibisciata (Schw.) Kellerm., teleutospores from *Muhlenbergia mexicana* (L.) Trin.; obtained aecidia [*Aecidium hibisciatum* Schw.] on *Hibiscus militaris* Cav. and *H. moscheutos* L.

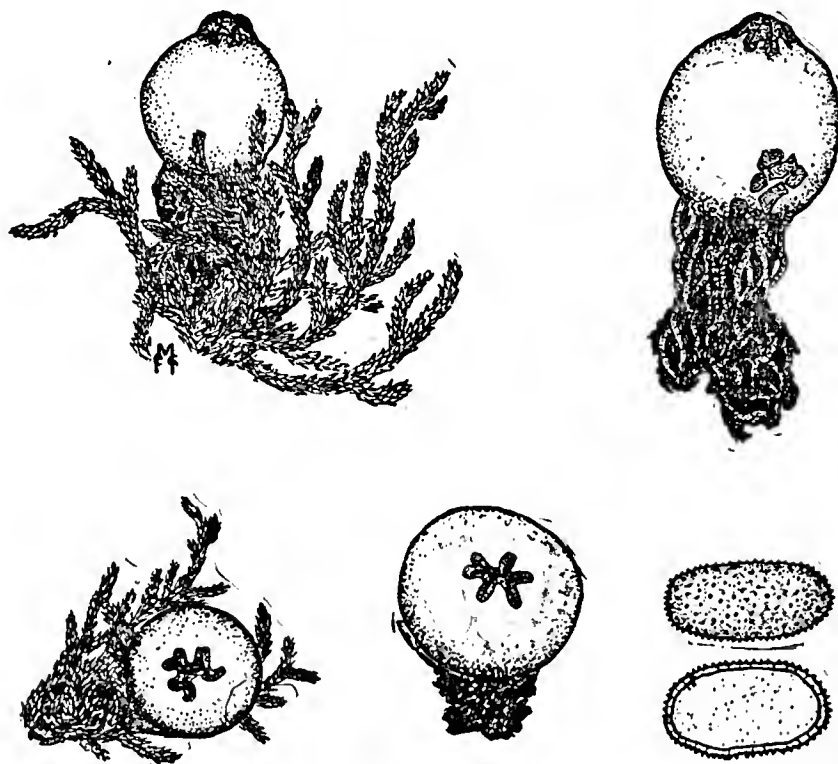
Puccinia lateripes Berk. & Rav., teleutospores from *Ruellia strepens*. Also aecidiospores from *Ruellia strepens* L.; obtained aecidia [*Aecidium lateripes* Kellerm], uredo and teleuto [*Puccinia lateripes* Berk. & Rav.] on *Ruellia strepens* L.

Puccinia subnitens Diet., teleutospores from *Distichlis spicata* (L.) Greene; obtained aecidia on *Chenopodium album* L.

MINOR MYCOLOGICAL NOTES. II.

W. A. KELLERMAN.

CALOSTOMA CINNABARINUM.—Recently specimens of this uncommon—or uncommonly collected—interesting little Puff-ball were kindly sent by Mrs. Annie Morrill Smith, which were col-



CALOSTOMA CINNABARINUM.

lected by Mrs. Sarah B. Hadley, South Canterbury, Connecticut, November 23, 1903. They represented the mature stage with the spores escaping. As nearly as could be determined they accorded well with the description of that species, but the spores were con-

siderably smaller than represented by Burnap (Bot. Gaz. 23:189, March 1897) who gives them as 15-18 x 8-10 μ . Our measurements are 10-15 x 8-10 μ . Lloyd (Myc. Notes, 13:126, Feb. 1903) says the spores vary "much as to size in specimens from different localities, and even in the same specimen. West Virginia specimens 10-14 x 6-8 mic. Massachusetts specimens 12-20 x 6-8 mic."

The figures here presented, prepared by Miss Clara G. Mark, show the two Connecticut plants natural size, as seen from the side and viewed from above. The spores shown to the right are magnified 250 diameters.

Since Burnap's study of the American species (l. c.) the number has been increased from three to four by the publication of a new one, namely, *Calostoma microsporum* by Professor Atkinson in the Journal of Mycology, 9:16, Feb. 1903. This he says resembles in the gross characters of the plant, *C. ravenelii*, but the spores are smaller; in the latter they are quite variable in size, 7-33 x 5-19 μ ; in *C. microsporum* they are 6-10 x 3½-5 μ , and do not show such great variations. A revised Key of the American species would be as follows:

CALOSTOMA.

Spores *smooth* and oblong

Small (6-10 x 3½-5 μ), *C. microsporum* Atkinson
Larger (7-22 x 5-19 μ), *C. ravenelii* (Berk.) Massee

Spores *echinulate* or *verrucose*

Globose and verrucose, *C. lutescens* (Schw.) Burnap
Oblong and echinulate, *C. cinnabarinum* Desv.

ABUNDANCE OF DARLUCA FILUM.—At one of the large commercial greenhouses in Columbus, Ohio, I had opportunity some time ago to see an unusual quantity of *Uromyces carophyllinus* on Carnation plants. There was a separate section of the greenhouse devoted to carnation growing, and the attack was so severe that comparatively few flowers were obtained for market. Many of the plants—in fact many beds of them—were literally blackened by the Rust, and their care by the florist had been abandoned. Desiring some of the Carnation Rust I returned in a week prepared to carry away a large quantity but was disappointed in securing the valuable booty. Not a single good herbarium specimen, or suitable material for class use, could be secured. The peculiar color of the affected plants raised suspicion at first sight, and inspection showed that the uredineous sori were riotously invaded by *Darluca filum*—but then I secured an ample quantity of this for the Ohio Fungi exsiccati.

NOTES FROM MYCOLOGICAL LITERATURE. VII.

W. A. KELLERMAN.

REVISSIONE DELLE FORME DEL GENERE *STEGANOSPORIUM* CORDA by Dr. Alberto Noelli, published in *Malpighia*, An. XVII, Fasc. IX, pp. 412-418, contains descriptions of *Steg. piriforme* Corda, *piriforme* var. *major* Ell. & Ev., *æsculi* Sacc., *compactum* Sacc., *muricatum* Bon., *cenangioides* Ell. & Roth., and *betulae* Noelli n. sp. (nei rami di *Betula alba*). Synonyms and text figures of the spores are given.

INFECTION-POWERS OF ASCOSPORES IN *ERYSIPHACEÆ*, by Ernest S. Salmon, *Journal of Botany*, May and June 1903 (41:159-165, 204-12) details a series of infection experiments with the ascospores of *Erysiphe graminis* DC. on *Hordeum vulgare*. Heretofore experiments carried on by several persons have proved the existence of "biologic forms" of several species, in the conidial stage, of the *Erysiphaceæ*. The experiments referred to in this paper seem to show conclusively that the infection-powers of the ascospores, of which nothing has hitherto been known, are restricted in a definite manner. The results of the experiments will appear in the *Beihefte* of the *Botanisches Centralblatt*.

A VERY COMPREHENSIVE TREATISE ON THE FUNGOUS DISEASES OF GRASSES is that by L. H. Pammel and J. B. Weems in the *Iowa Geological Survey, Bulletin 1* (pp. 185-292, 1901). Historical and descriptive notes are given of all the common fungi occurring on the native and cultivated grasses. Very many text figures and plates add much to the value of the article, which will prove very useful to beginners and amateurs, and even to professional botanists. The date in the preface shows that it was completed in 1899, but evidently there was considerable delay in publication. Consequently the nomenclature is not always such as the American mycologists use to-day.

DOTT. C. MASSALONGA IN *NOTE MICOLOGICHE* published in *Malpighia*, An. XVII, Fasc. IX, pp. 419-423, discusses the following: (1) Sulla causa di un precoce disseccamento delle foglie di *Quercus pubescens* Willd. (with description of *Gloeosporium nervicolum* C. Massal. in litt.); (2) Sull antracnosi delle foglie di *Populus tremula* L.; (3) Di un ifomicete che vive parassita sul tallo di *Candelaria vulgaris* A. Massal. (with description of *Fusarium lechenicolum* C. Massal. in litt.)

A NEW SPECIES OF *GEASTER* is described and figured in the *Botanical Gazette*, 36:303-6, Oct. 1903, by George F. Atkinson; it is called *Geaster leptospermus* Atks. & Coker. It is remarkable in its (1) habitat (on bark of living trees among moss); (2) belongs to the fornicate section of the genus (in which but few

species are listed); (3) the spores are smooth (not echinulate or tuberculate as in the other species). The plants are oval to globose, only 3-4½ mm. in diameter, and inconspicuous before dehiscence takes place. It affects the same situation as *Lycoperdon leprosum*, with which it is often associated, but the individuals are scattered—never growing in close clusters.

DIE MIKROSPOREN VON *ANTHOCEROS DICHOTOMUS* Raddi, *Tilletia abscondita* Syd. nov. spec., Ann. Mycol. 1:174-76, March 1903, von H. u. P. Sydow, refers to the microspores found in the genus *Sphagnum*; after quoting a paragraph from Nawaschin, he adds: "Die 'Mikrosporen' von *Anthoceros dichotomus* gleichen nun sehr denjenigen der *Sphagnum*-Arten. Sie sind kugelig oder fast kugelig, seltener elliptisch, hellbraun, mit warzig-netzförmiger Struktur, analog den meisten Ustilagineen-Sporen, versehen; sie messen 11-17 μ im Durchmesser (selten bis 20 μ lang), sind also grösser als die Mikrosporen der *Sphagnum*-Arten, welche nur 11-12 μ diam. erreichen. Das Episor ist etwa 2½ μ breit. Wir sind überzeugt, dass auch diese 'Mikrosporen' einer Ustilaginee angehören und benennen unsere Art als *Tilletia? abscondita* Syd. nov. spec."

JAKOB ERIKSSON, IN ARKIV FÖR BOTANIK, BAND 1 (pp. 139-146), presents a paper read May 13, 1903, commenting on the researches of Professor H. Marshall Ward and the objections urged to the Mycoplasm Hypothesis. He takes occasion to reaffirm strongly his original view of this matter and I therefore transcribe the following portion of the paper: "I first beg to draw attention to the fact that my theory consists of two essential moments. In the first place I have asserted, that when it is a question of explaining the origin of soral flecks (spots or sori of uredospores) in general, we have to take into account not only external infection from the surroundings (*Uredo*—and *Aecidium*-pustules), but also a hitherto unnoticed internal germ of disease in one form or another, and I have based my assertion of the *existence* of an internal germ of disease on such numerous observations in the open and such numerous experiments in isolated glass houses, that I venture to regard this existence as proved, at least until sufficiently comprehensive proofs to the contrary have been produced from some other quarter. In the next place, when attempting to explain the *form* in which such an internal germ of disease could be thought to exist, I have expressed the hypothesis—grounded on anatomical examinations—that in the life of the fungus there may be a period of development previous to the mycelium-stage when the fungus exists in a latent symbiotic life with the protoplasm of the host, and I have proposed the name 'Mycoplasm' for the double organism I had thus supposed. I have, however, expressly emphasized that it was not my intention that this very intricate question should by any means be considered as exhaustively solved, but that I merely wished to main-

tain the hypothesis of Mycoplasma until a better solution should be proposed."

CERCOSPORITES SP., A NEW FOSSIL FUNGUS, by Ernest S. Salmon (Jour. Bot. 41:127-130, April 1903), is the title of a critical review of "Microflora e Microfauna nel disodile di Melilli in Sicilia," L. Pampaloni (Rendiconti della R. Accad. dei Lincei, 11:250-1, 1902). In the latter paper two genera of Erysiphaceæ are described, namely, Uncinulites (U. baccarini) and Erysiphites (E. melilli). After examination of the material Mr. Salmon concludes that the portion called by Dr. Pampaloni a perithecium consists of a single cell—and hence neither of these fossil plants have anything to do with Erysiphaceæ. He ventures no further interpretation of the Erysiphites, "whether of animal or vegetable origin," but the fungus called Uncinulites he regards as referable to the genus Cercospora agreeing in some respects with Cercospora acerina described by Hartig. Salmon concludes his article as follows: "The following diagnosis may be given of this fossil fungus: Cercosporites sp. Hyphæ myceliales filamentosæ singulatim repentes dilute brunneæ septatæ 5-8 μ diam. hinc inde in cellulas magnas 15-23 μ diam. maturitate opacas atrobrunneas plus minus globosas 3-6-catenulatas vel raro biseriatim aggregatas probabiliter pro sclerotiis habendas subito inflat."

ON SPECIALIZATION OF PARASITISM IN THE ERYSIIPHACEÆ, by Ernest S. Salmon, referred to previously in these Notes, is published in the Beihefte zum Botanischen Centralblatt, Band XIV, Heft 3, pp. 261-315, pl XVIII. It is a full account of work done, methods, and additional results, pertaining to the question of 'biologic forms,' and to this comprehensive article the interested reader is referred as no brief outline would be satisfactory. A Bibliography of ten entries is included. Convenient tables give a synopsis of the work done by the author.

FUNGUS ENEMIES OF APPLE, PEAR AND QUINCE, by F. L. Stevens, published in the N. C. Agr. Exp. Sta. Bulletin No. 183 (pp. 64-82), April 1903, gives a popular account with several text-figures of the common fungous parasites as Apple Scab, Fire Blight, Rust (Gymnosporangium), Bitter-rot, Pear Scab, Leaf Spot (Septoria), Leaf Blight (Entomosporium), etc.

IN THE OESTERREICHISCHE BOTANISCHE ZEITSCHRIFT for 1903, Nos. 4-8, A. Zahlbruckner publishes an article entitled Vorarbeiten zu einer Flechtenflora Dalmatiens. Several new species are described.

P. DIETEL TRANSFERS UREDO LÆVIUSCULA D. & H., which was published in Erythea, 2:127, based upon material collected in California on Polypodium californicum, to Thekopsora. A re-examination of the material revealed teleutospores; the name now given is Thekopsora læviuscula D. & H. See Annales Mycologici, 1:416. Sept. 1903.

R. MAIRE AND P. A. SACCARDO UNDER THE TITLE SUR UN NOUVEAU GENRE DE PHACIDIACEES, Ann. Mycolog. 1:417-9, Sept. 1903, furnishes the diagnosis of *Didymascella* Maire et Sacc. gen. nov. "A *Didymasco* sporidiis phæodidymis, nec non habitu ascomatis paraphysibusque recedit, et certe ad Phacidiaceus proxime accedit.

MICHIGAN MUSHROOMS, A FEW OF THE COMMON EDIBLE FUNGI occurring in the State, are described and illustrated by B. O. Longyear in the Mich. Exp. Sta. Bull. 208:79-100, April 1903. The Morels and Puffballs with a general account of the character and structure of Mushrooms occupy the pages — presented in a very acceptable manner for beginners in Mycology.

BACTERIAL SPOT, A NEW DISEASE OF CARNATIONS, by A. F. Woods, is published in Science, N. S. 18:537-8, October 23, 1903. The organism causing this spot disease is said to be quite distinct from the orange-colored *Bacterium dianthi* described on this host by Arthur and Bolley. Successful inoculations have been made; complete cultural characters for various media will be determined. The author says that under natural conditions the bacteria appear to gain entrance to the leaves and stems from the slight injuries produced by the red spider and by other causes.

MYCOLOGISCHE FRAGMENTE VON PROF. DR. FRANZ V. HÖHNEL in Wien, published in Annales Mycologici, 1:391-414, contains the descriptions of a large number of new species and also the following genera: *Heimerlia novum* Myxomycetum (Echinosteliacearum) genus; *Siropatella* n. g. Excipulacearum; *Agyriellopsis* n. g. Excipulacearum. Critical notes on several species also are given. Concerning *Exosporium rosæ* Fuckel the author states that it is no *Exosporium*; it is *Cercospora rosæ* (Fuckel) de Höhnel with synonymy as follows: *Exosporium rosæ* Fckl. Symb. Myc., *Cercospora rosicola* Allesch. & Schnabl (non Pass.) F. Bavar. 498, *C. rosæ-alpinæ* C. Mass. and *C. hypophylla* Cava. Cavara.

VERSUCHE MIT HETEROECISCHEN ROSTPILZEN, Vorläufige Mitteilung, by W. Tranzschel, Centrbl. Bakt. Parasit. Infek. 2. Ab. 11:106, 1903, states in part as follows: "In einer Reihe von Versuchen gelang es durch Aussaat der Sporen von *Aecidium leucospermum* DC. (auf *Anemone nemorosa* L.) auf *Sorbus Aucuparia* L. die Uredosporen von *Ochrospora Sorbi* (Oud.) Diet. zu erzeugen. *Puccinia Polygoni amphibii* Pers. (auf *Polyg. amphibium* L.) ergab das *Aecidium sanguinolentum* Lindr. auf *Geranium palustre* L. und *G. pratense* L. Die der *Pucc. Polygoni amphibii* Pers. entsprechende Micro-Art) ist *Pucc. Morthieri* Körn."

INDEX TO UREDINEOUS CULTURE EXPERIMENTS WITH LIST OF SPECIES AND HOSTS FOR NORTH AMERICA. I.

W. A. KELLERMAN.

Careful culture work to determine life histories of fungi or cycles of development was initiated by De Bary in 1865. It was continued by him in 1866 and in the same year also taken up by Oersted and Woronin. A few years later other foreign botanists engaged in similar work, and the list continued to the present, contains such additional names as Schroeter, Rostrup, Winter, Schenk, Cornu, Plowright, Klehban, Hartig, Dietel, Barclay, Fischer, Tubeuf, Soppit, Transchal Eriksson Pazschke, Juel, Wagner, Bubák, Jacky, Shirai, Müller, and Ward.

In America Dr. Farlow was the pioneer worker, publishing his first experiments on the "Gymnosporangia or Cedar Apples of the United States" in 1880. He continued work on the same group in 1885, and it was supplemented (independently) by Halsted in 1886-7, published in the Bulletin of the Iowa Agricultural College. More fruitful results were obtained by Thaxter in 1887 and again in 1889—the connection between the several species of Gymnosporangium and associated Roestelia occurring in this country being satisfactorily established, which may be found in print in the Proceedings of the American Academy of Arts and Sciences, Boston; and Bulletin 134, Conn. Agr. Exp. Sta. Pammel repeated the experiment verifying connection in case of one of the species (Ia. Hort. Soc. Rep. 1893), the same also by Stewart and Carver (Proc. Ia. Acad. Sci. for 1895, vol. 3; same in N. Y. Exp. Sta. for 1895.)

No connections between Uredineous forms were then experimentally determined—except that Howell (in 1890) showed the three stages of the Clover Rust to be genetically related, and Clinton (in 1894) the two stages of the Bramble Rust—until 1899 when extended and important work was reported by Arthur and by Carleton. The latter dealt with the Cereal Rusts only, making sowings almost exclusively of Uredospores mainly from Wheat, Oats, Barley, Rye, and Maize, on the same and on different host species. The interesting results were published as Bulletin No. 16, U. S. Dept. Agr. Div. Veg. Physiology & Pathology, April 23, 1899.

Arthur communicated his first results to the public in a paper read before the A. A. A. S., Botanical Section, Columbus, Ohio, Ag 1899, and the same was published in the Botanical Gazette, 29:268-276, April 1900. Of eleven species of Uredineæ, the

æcidial and teleutosporic forms were definitely connected by these cultures. In the *Journal of Mycology* (8:51-6), June 1902, he reported cultures made in 1900 and 1901—successful inoculations in eight cases, four being repetitions of previously demonstrated connections, and the complete cycle for four being reported here for the first time. Arthur's third report (cultures in 1902) was published in the *Botanical Gazette* (35:10-23) for January 1903. The successful cultures made number eleven previously reported and seven reported for the first time.

In 1902 cultures were undertaken by Kellerman. The first case of demonstrated connection was published in the *Journal of Mycology*, 8:20, May 1902, and appeared in the same periodical (9:6-13) in Feb. 1903. This showed seven successful inoculations, two of these not having been previously demonstrated. The second Report (continuing his work during 1903) detailing more extended cultures was given in part in the *Journal of Mycology* (9:109-10) May 1903, and the year's work is reported in full on a previous page of this number of the *Journal* issued simultaneously with (and included in) this Index.

This brief historical outline (some of the items of which were furnished by Dr. Arthur) shows that as yet comparatively few American mycologists have undertaken culture work to determine life cycles of our numerous species of Uredineæ; but this interesting and important work will doubtless have shortly its due proportion of devotees. It may therefore be a service to workers to put on record for convenient reference, all that has been done heretofore with American material. The maximum usefulness of the Index will perhaps be realized by adopting an alphabetical arrangement, and including Authors, Host-species furnishing material for inoculation, species of Uredineæ used, Host-species on which successful inoculations have been reported, and the Uredineous species in their several stages that have been obtained by the cultures. Abundant cross-references and common synonyms will be found in proper place. No inconvenience will then be encountered under whatever subject or name search is made.

An explanation for a single item will illustrate the plan of the Index and suggest (though it is hoped not necessary) the interpretation of the entries. Taking a case, say Dr. Arthur's experiment showing the genetic connection of *Puccinia angustata* Pk. and *Aecidium lycopi* Ger., we find four entries printed as follows:

(1) *Puccinia angustata* Pk. from *Scirpus atrovirens* (*Aecidium lycopi* Ger. on *Lycopus americanus*). J. C. Arthur. *Jour. Mycol.* 8:53. June, 1902.

This, as would readily be surmised, means that culture material (teleutospores) of *Puccinia angustata* Pk. taken from *Scirpus atrovirens*, produced *Aecidium lycopi* Ger. when sown

on *Lycopus americanus*, the work being done by Arthur and reported in the *Journal of Mycology*, Volume 8, page 53, June 1902. But the same experiment is also found in the following:

(2) *Scirpus atrovirens* (*Aecidium lycopi* Ger. on *Lycopus americanus*), *see* *Puccinia angustata* Pk. from *Scirpus atrovirens*. [Arthur.]

It will be noticed that all of the facts are given in this cross-reference that are contained in the first paragraph reproduced—obviating the necessity of turning to another entry—except that the place of publication is not here repeated, which is always given where the first word of the entry is the name of the species experimented with, i. e., whose spores were used as culture material. To put this into a sentence it would be: From *Scirpus atrovirens* culture material was taken by means of which there was produced *Aecidium lycopi* Ger. on *Lycopus americanus*, said culture material being teleutospores of *Puccinia angustata* Pk. taken from plant first named, experiment by Arthur. The third entry for the culture under consideration is as follows:

(3) *Aecidium lycopi* Ger. on *Lycopus americanus*, *see* *Puccinia angustata* Pk. from *Scirpus atrovirens*. [Arthur.]

The same being translated is: *Aecidium lycopi* Ger. was produced on *Lycopus americanus* by using teleutospores of *Puccinia angustata* Pk. taken from *Scirpus atrovirens*, experiment by Arthur. But a fourth entry is made in the following form:

(4) *Lycopus americanus* (*Aecidium lycopi* Ger.) *see* *Puccinia angustata* Pk. from *Scirpus atrovirens*. [Arthur.]

This would be first found in case search was made for *Lycopus* as a host plant on which an æcidium occurred. The entry would be read: On *Lycopus americanus* was produced *Aecidium Lycopi* Ger. with teleutospores of *Puccinia angustata* Pk. taken from *Scirpus atrovirens* in an experiment by Arthur.

In case uredospores or æcidiospores were used these words (or *Uredo* or *Aecidium*) immediately follow the name of the species in each of the entries.

It will be noticed that “from” is always to be preceded by culture material, and that “on” is preceded by æcidia, etc., produced by the inoculation.

Brackets are used for hosts, when the indexer does not find printed in immediate connection the items so enclosed, but determined the same from the context or other ample evidence derived from the author's publication. Thanks are extended in advance to mycologists who will kindly notify me of additions or corrections that should be made.

A summary or list of Alternate Forms follows the first part of the Index in which are given for quick reference the genetic connections established by the cultures recorded, listed in alphabetical order under two heads. Thus the fact demonstrated that

Puccinia windsoriæ Schw. and *Aecidium pteleæ* B. & C. are alternate forms would be shown by either or both of the following entries:

Aecidium pteleæ B. & C. — *Puccinia windsoriæ* Schw.
Puccinia windsoriæ Schw. — *Aecidium pteleæ* B. & C.

This INDEX will be reprinted as a *Separate* for those who may wish it in form for convenient use (price 25 cents) and Supplementary Lists will be published from time to time. It has seemed best to list names generally according to most recent nomenclature, necessary cross-references obviating any inconvenience that otherwise might occur.

AECIDIUM albiperidium Arth. on *Ribes cynosbati* L., *see Puccinia albiperidia* Arth. from *Carex pubescens*. [Arthur.]

AECIDIUM asterum Schw. on *Aster paniculatus* and *A. cordifolius*, *see Puccinia caricis-asteris* Arth. from *Carex foenea*. [Arthur].

AECIDIUM berberidis from [*Berberis vulgaris*] (*Puccinia graminis tritici* on *Hordeum* [distichum]). Mark Alfred Carleton. U. S. Dept. Agr. Div. Veg. Phys. & Path. Bull. 16:54. 27 Sept. 1899.

AECIDIUM berberidis on *Berberis vulgaris*, *see Puccinia poculiformis* (Jacq.) Wettst. from *Cinna arundinacea*. [Arthur].

AECIDIUM calystegiæ Desm. on *Convolvulus sepium*, *see Puccinia convolvuli* Cast. from *Convolvulus sepium*. [Arthur]

AECIDIUM caulicolum Kellerm., *see Puccinia caulicola* Tr. & Gall. from *Salvia lanceolati*. [Kellerman]

AECIDIUM cirsii-lanceolata Kellerm. on *Carduus lanceolatus* L., *see Puccinia cirsii-lanceolati* Schroet. from *Carduus lanceolatus* L. [Kellerman]

AECIDIUM ellisii Tr. & Gall. on *Chenopodium album* L., *see Puccinia subnitens* Diet. from *Distichlis spicata* (L.) Greene. [Arthur]

AECIDIUM [erigeronatum Schw.] on *Erigeron annuus*, *see Puccinia caricis-erigerontis* Arth. from *Carex festucacea*. [Arthur]

AECIDIUM euphorbiæ Am. Auct., *see Uromyces euphorbiæ* C. & P. [Arthur]

AECIDIUM fraxini Schw. on *Fraxinus viridis*, *see Puccinia peridermiospora* (E. & T.) Arth. from *Spartina cynosuroides*. [Arthur]

AECIDIUM on *Helianthus* [sp.], *see Puccinia helianthi* from *Helianthus* [sp.]. [Carleton]

- AECIDIUM hibisci* Schw. on *Hibiscus militaris* Cav., *see* *Puccinia hibisci* (Schw.) Kellerm. from *Muhlenbergia mexicana* (L.) Trin. [Kellerman]
- AECIDIUM hibisci* Schw. on *Hibiscus moscheutos*, *see* *Puccinia hibisci* (Schw.) Kellerm. (*P. muhlenbergiae* Arth. & Hol.; *P. windsorae* Burr. non Schw.) from *Muhlenbergia mexicana*. [Kellerman]
- AECIDIUM impatientis* Schw. on *Impatiens aurea* Muhl., *see* *Puccinia rubigo-vera* [*P. impatientis* (Schw.) Arthur] from *Elymus virginicus* L. [Arthur]
- AECIDIUM jamesianum* on *Asclepias incarnata* and *A. syriaca* L., *see* *Puccinia bartholomæi* Diet. [*P. jamesiana* (Pk.) Arth.] from *Atheropogon curtipendulus* Fourn. (*Bouteloua curtipendula* Torr.) [Arthur]
- AECIDIUM lateripes* Kellerm. on *Ruellia strepens*, *see* *Puccinia lateripes* B. & Rav., from *Ruellia strepens*. [Kellerman]
- AECIDIUM lateripes* Kellerm., *see* *Puccinia lateripes* B. & Rav. Aecidiospores [*Aecidium lateripes* Kellerm.] from *Ruellia strepens*. [Kellerman]
- AECIDIUM lycopi* Ger., *see* *Puccinia angustata* Pk. aecidiospores (*Aecidium lycopi* Ger.). [Arthur; Kellerman]
- AECIDIUM lycopi* Ger. on *Lycopus americanus*, *see* *Puccinia angustata* Pk. from *Scirpus atrovirens*. [Arthur]
- AECIDIUM oenotheræ* Pk., *see* *Ae. peckii* DeToni. [Kellerman]
- AECIDIUM osmorrhizæ* Pk. from *Washingtonia claytoni* (*Osmorrhiza brevistylis*) ([*Puccinia osmorrhizæ teleuto*] on *Chærophyllum procumbens* and (?) on *Washingtonia claytoni*). W. A. Kellerman, Jour. Mycol. 9:10. Feb. 1903.
- AECIDIUM pammelii* Trel. from *Euphorbia corollata* L. (*Puccinia panici* Diet. uredo on *Panicum virgatum*). William Stuart. Proc. Ind. Acad. Sci. 1901:284. 1902.
- AECIDIUM peckii* DeToni [*Ae. oenotheræ* Pk.] on *Onagra biennis* (L.) Scop. [*Oenothera biennis* L.] *see* *Puccinia peckii* (DeToni) Kellerm. (*P. caricina* DC. p.p.) from *Carex trichocarpa*. [Kellerman]
- AECIDIUM peckii* DeT. on *Onagra biennis* (L.) Scop. (*Oenothera biennis* L., *see* *Puccinia peckii* (DeT.) Kellerm. from *Carex trichocarpa* Muhl. [Arthur]
- AECIDIUM pentstemonis* Schw. on *Pentstemon pubescens*, *see* *Puccinia americana* Lagh. from *Andropogon scoparius*. [Arthur]

- AECIDIUM pentstemonis spermogonia* on *Pentstemon hirsutus*, *see* *Puccinia andropogonis* Schw. from *Andropogonis scoparius*. [Kellerman]
- AECIDIUM plantaginis* Ces (?) on *Plantago rugelii*, *see* *Uromyces aristidæ* E. & E. from *Aristida oligantha* Mx. [Arthur]
- AECIDIUM pteleæ* on *Ptelea trifoliata*, *see* *Puccinia windsoriæ* Schw. from *Tricuspis seslerioides* Torr. (*Triodea cuprea* Jacq.) [Arthur]
- AECIDIUM pteleæ* on *Ptelea trifoliata*, *see* *Puccinia windsoriæ* Schw. from *Tricuspis seslerioides*. [Kellerman]
- AECIDIUM ranunculacearum* (?) on *Anemone canadensis*, *see* *Puccinia simillima* Arth. from *Phragmites phragmites* (L.) Karst. (*P. communis* Trin.). [Arthur]
- AECIDIUM rubellum* Pers. on *Rumex crispus*, *R. obtusifolius*, *see* *Puccinia phragmitis* (Schum.) Körn. from *Phragmites communis*. [Arthur]
- AECIDIUM* [rubellum] on *Rumex altissimus*, *see* *Puccinia phragmitis* (Schw.) Körn. from *Phragmites phragmites*. [Bates]
- AECIDIUM sambuci* Schw. on *Sambucus canadensis*, *see* *Puccinia atkinsoniana* Diet. from *Carex lurida*. [Kellerman]
- AECIDIUM sambuci* Schw. (?), *see* *Puccinia bolleyana* Sacc. aecidiospores (*Aecidium sambuci* Schw. ?). [Stuart]
- AECIDIUM sambuci* Schw. (?) on *Sambucus canadensis*, *see* *Puccinia bolleyana* Sacc. from *Carex trichocarpa*. [Arthur]
- AECIDIUM sambuci* Schw. on *Sambucus canadensis*, *see* *Puccinia bolleyana* Sacc. from *Carex trichocarpa*. [Kellerman]
- AECIDIUM smilacis* Schw. on *Smilax herbacea* L. and *S. hispida* Muhl., *see* *Puccinia amphigena* Diet. from *Calamovilfa longifolia* (Hook.) Hack. [Arthur]
- AECIDIUM solidaginis* Schw. on *Solidago canadensis* L., *S. cæsia* L. (spermogonia), *S. rigida* L. (spermogonia), *S. serotina* Ait., and *S. ulmifolia* Muhl. (spermogonia), *see* *Puccinia caricis-solidaginis* Arth. from *Carex jamesii* Schw. [Arthur]
- AECIDIUM solidaginis* Schw. on *Solidago canadensis* and *S. serotina*, *see* *Puccinia caricis-solidaginis* Arthur from *Carex stipata* Muhl. [Arthur.]
- AECIDIUM urticæ* Schum., *see* *Puccinia caricis* (Schum.) Reb. aecidiospores (*Aecidium urticæ* Schum.) [Arthur]
- AECIDIUM urticæ* Schum. on *Urtica gracilis*, *see* *Puccinia caricis* (Schum.) Reb. from *Carex riparia*. [Kellerman]

AECIDIUM urticae Schum. on *Urtica gracilis*, *see* *Puccinia caricis* (Schum.) Reb. from *Carex stricta*. [Kellerman]

AECIDIUM urticae on *Urtica gracilis*, *see* *Puccinia caricis* (Schum.) Reb. from *Carex stricta*. [Arthur]

AECIDIUM verbenicola K. & S., *see* *Puccinia vilfae* A. & H. æcidiospores (*Aecidium verbenicola* K. & S.). [Arthur]

AGROPYRON richardsoni (*Puccinia graminis tritici*), *see* *Puccinia graminis tritici* uredospores from *Triticum vulgare*. [Carleton]

ALOPECURUS alpestris (*Puccinia coronata* Corda), *see* *Puccinia coronata* Corda uredospores from *Avena sativa*. [Carleton]

AMELANCHIER botryapium, *see* *Amelanchier* [canadensis] and *A. botryapium*. [Halsted]

AMELANCHIER botryapium (*Roestelia botryapites* Schw.), *see* *Gymnosporangium clavariæforme* DC. from *Juniperus communis* L. [Halsted]

AMELANCHIER canadensis (*Roestelia aurantiaca*), *see* *Gymnosporangium clavipes* from [Juniperus virginiana]. [Thaxter]

AMELANCHIER [canadensis] (*Roestelia botryapites* Schw.), *see* *Gymnosporangium clavariæforme* DC. from *Juniperus canadensis*. [Halsted]

AMELANCHIER canadensis (*Roestelia botryapites*), *see* *Gymnosporangium biseptatum* from [Cupressus thyoides]. [Thaxter]

AMELANCHIER canadensis (*Roestelia cornuta*), *see* *Gymnosporangium conicum* from [Juniperus virginiana]. [Thaxter]

AMELANCHIER canadensis (*Roestelia nidus-avis* Thax.), *see* *Gymnosporangium nidus-avis* Thax. from *Juniperus virginiana*. [Thaxter]

(?) AMELANCHIER canadensis (*Roestelia transformans* (?)), *see* *Gymnosporangium ellisii* from [Cupressus sp.]. [Thaxter]

AMELANCHIER canadensis (—————? spermogonia), *see* *Gymnosporangium biseptatum* from [Cupressus thyoides]. [Farlow]

AMELANCHIER canadensis (—————? spermogonia), *see* *Gymnosporangium clavipes* from [Juniperus virginiana]. [Farlow]

AMELANCHIER canadensis (—————? spermogonia), *see* *Gymnosporangium macrocarpus* from *Juniperus virginiana*. [Farlow]

- ANDROPOGON scoparius ([*Aecidium pentstemonis*] *spermogonia* on *Pentstemon hirsutus*), *see* *Puccinia andropogonis* Schw. from *Andropogon scoparius*. [Kellerman]
- ANDROPOGON scoparius (*Aecidium pentstemonis* Schw. on *Pentstemon pubescens*), *see* *Puccinia americana* Lagh. from *Andropogon scoparius*. [Arthur]
- ANDROPOGON scoparius (*Puccinia americana* Lagh. uredo), *see* *Puccinia americana* Lagh. *aecidiospores* [*Aecidium pentstemonis* Schw.] from *Pentstemon pubescens*. [Arthur]
- ANEMONE canadensis (*Aecidium ranunculacearum* [?]), *see* *Puccinia simillima* Arth. from *Phragmites phragmites* (L.) Karst. (*P. communis* L.) [Arthur]
- ANTHOXANTHUM odoratum (*Puccinia coronata* Corda), *see* *Puccinia coronata* Corda uredospores from *Avena sativa*. [Carleton]
- ARISTIDA oligantha Mx. (*Aecidium plantaginis* Ces (?)) on *Plantago rugelii*, *see* *Uromyces aristidæ* E. & E. from *Aristida oligantha* Mx. [Arthur]
- ARRHENATHERUM elatius (*Puccinia coronata* Corda), *see* *Puccinia coronata* Corda *aecidiospores* from *Rhamnus lanceolata*. [Carleton]
- ARTHUR, J. C. *Chrysanthemum* Rust. Ind. Agr. Exp. Sta. Bull. 85:143-150. Oct. 1900.
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- ARTHUR, J. C. Cultures of Uredineæ in 1902. Bot. Gaz. 35: 10-23. Jan. 1903.
- ASCLEPIAS incarnata (*Aecidium jamesianum*), *see* *Puccinia bartholomæi* Diet. [*P. jamesiana* (Pk.) Arth.] from *Atheropogon curtispendus* Fourn. (*Bouteloua curtispendula* Torr.). [Arthur]
- ASCLEPIAS syriaca L. (*Aecidium jamesianum*), *see* *Puccinia bartholomæi* Diet. [*P. jamesiana* (Pk.) Arth.] from *Atheropogon curtispendus* Fourn. (*Bouteloua curtispendula* Torr.). [Arthur]
- ASTER cordifolius (*Aecidium asterum* Schw.), *see* *Puccinia caricis-asteris* Arth. from *Carex foenea*. [Arthur]
- ASTER paniculatus (*Aecidium asterum* Schw.), *see* *Puccinia caricis-asteris* Arth. from *Carex foenea*. [Arthur]

- ASTER paniculatus (*Puccinia caricis-asteris* Arth. æcidia), *see* *Puccinia caricis-asteris* Arth. from *Carex foenea* Willd. [Arthur]
- ATHEROPOGON curtispendus Fourn. (*Bouteloua curtispendula* Torr.) (*Aecidium jamesianum* on *Asclepias incarnata* and *A. syriaca* L.), *see* *Puccinia bartholomæi* Diet. [*P. jamesiana* (Pk.) Arth.] from *Atheropogon curtispendus* Fourn. (*Bouteloua curtispendula* Torr.). [Arthur]
- AVENA fatua (*Puccinia coronata* Corda), *see* *Puccinia coronata* Corda uredospores from *Avena sativa*. [Carleton]
- AVENA pratensis (*Puccinia coronata* Corda), *see* *Puccinia coronata* Corda uredospores from *Avena sativa*. [Carleton]
- AVENA sativa (*Puccinia coronata* Corda), *see* *Puccinia coronata* Corda æcidiospores from *Rhamnus lanceolata*. [Carleton]
- AVENA sativa (*Puccinia coronata* Corda), *see* *Puccinia coronata* Corda uredospores from *Avena sativa*. [Carleton]
- AVENA sativa (*Puccinia coronata* Corda on *Alopecurus alpestris*, *Anthoxanthum odoratum*, *Avena fatua*, *A. pratensis*, *A. sativa*, *Dactylis glomerata*, *Eatonia* sp. indet., *Festuca* sp. indet., *Koeleria cristata*, *Phalaris arundinacea*, *Phleum pratense*, *Polypogon monspeliensis*), *see* *Puccinia coronata* Corda uredospores from *Avena sativa*. [Carleton]
- AVENA sativa (*Puccinia graminis*), *see* *Puccinia graminis* uredospores. [Hitchcock & Carleton]
- AVENA sativa (*Puccinia graminis*), *see* *Puccinia graminis* uredospores from *Avena sativa*. [Hitchcock & Carleton]
- AVENA sativa (*Puccinia graminis* on *Avena sativa*), *see* *Puccinia graminis* uredospores from *Avena sativa*. [Hitchcock & Carleton]
- BARLEY, *see* *Hordeum distichum*.
- BATES, John M. The finding of *Puccinia phragmitis* (Schum.) Körn in Nebraska.
- BERBERIS vulgaris (*Aecidium berberidis*), *see* *Puccinia poculiformis* (Jacq.) Wettst. from *Cinna arundinacea*. [Arthur]
- BERBERIS vulgaris (*Puccinia graminis tritici* on *Hordeum* [distichum]), *see* *Aecidium berberidis* from [*Berberis vulgaris*]. [Carleton]
- BOUTELOUA curtispendula Torr., *see* *Atheropogon curtispendus* Fourn. [Arthur]
- CÆOMA miniata Am. Auct. on *Rosa* [Tea rose, Kaiserin Augusta Victoria], *see* *Phragmidium speciosum* Fr. from *Rosa* sp. [Arthur]

- CÆOMA ulmariae Thüm., *see* Triphragmium ulmaria (Schum.) Lk. aecidiospores. [Arthur]
- CÆOMA ulmariae Thüm., *see* Triphragmium ulmariae (Schum.) Lk. (Cæoma ulmariae Thüm.). [Arthur]
- CALAMOVILFA longifolia (Hook.) Hack. (Aecidium smilacis Schw. on Smilax herbacea L. and S. hispida Muhl.), *see* Puccinia amphigena Diet. from Calamovilfa longifolia (Hook.) Hack. [Arthur]
- CARDUUS lanceolatus L (Puccinia cirsii-lanceolati Schroet. aecidia [Aecidium cirsii-lanceolati Kellerm.]), uredo and teleuto on Carduus lanceolatus L., *see* Puccinia cirsii-lanceolati Schroet. from Carduus lanceolatus L. [Kellerman]
- CARDUUS lanceolatus L. (Puccinia cirsii-lanceolati Schroet. aecidia [Aecidium cirsii-lanceolati Kellerm.], uredo and teleuto), *see* Puccinia cirsii-lanceolati Schroet. [Kellerman]
- CAREX festucacea (Aecidium [erigeronatum Schw.] on Erigeron annuus), *see* Puccinia caricis-erigerontis Arth. from Carex festucacea. [Arthur]
- CAREX festucacea Willd. (Puccinia caricis-erigerontis Arth. aecidia on Erigeron annuus (L.) Pers., E. philadelphicus L. and Leptilon canadense (L.) Britt.), *see* Puccinia caricis-erigerontis Arth. from Carex festucacea Willd. [Arthur]
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(To be continued)

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NOTES.

THE present number closes Volume 9, and hereafter the Journal will be issued more frequently; the number of pages per year will be somewhat increased. The bi-monthly series will begin the middle or latter part of January, 1904, and be issued ordinarily between the 15th and 30th day, on successive alternate months through the year.

SUBSCRIBERS will please observe that the price for 1904 is \$2.00 (foreign \$2.25), instead of \$1.00 as heretofore. It is hoped that such support will come from the numerous professional and amateur botanists of our country and abroad, as will materially decrease the annual cash deficit.

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IT should be noted by new subscribers and others who may wish back Volumes, that Vols. I.-VII. are out of print and cannot be supplied — but the contemplated Summary Volume would in an essential manner re-place them. Moreover, the price of the available Volumes (all of the new series), namely, Vols. 8 and 9, is \$2.00 each — *not* \$1.00 for which amount they were originally published.

AGAIN Mycologists are cordially invited to make use of the pages of the Journal. More frequent publication will doubtless be welcomed by all, contributors as well as subscribers. MSS. should be at hand the first day of the month or earlier if feasible. Reprints, when ordered, will be furnished at cost.

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